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GOLD MEDAL (NAVAL) PRIZE ESSAY FOR 1918.

Subject:—

"THE INFLUENCE OF THE SUBMARINE IN NAVAL WARFARE IN THE FUTURE."

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Motto:—"PLUS ÇA CHANGE, PLUS C'EST LA MÊME CHOSE."

IN an essay of this nature it is desirable, if not necessary, to approach the subject from a definite point of view.

Moltke wisely said: "All war problems should be investigated from a national point of view." This advice will be followed, and the influence of submarines on future war will be examined particularly from the point of view of the British Empire; but before attempting to discuss our subject it is desirable to state briefly what we understand by "Naval Warfare."

All war depends on motion, and motion depends on lines of communication. The sea is of varying importance to every nation from the point of view of the communications which lie across it, and to no State has it a greater importance from this reason than it has to the British Empire.

(AUTHOR'S NOTE:—Owing to circumstances beyond my control, this essay was submitted for competition in a somewhat unpolished condition. A few minor corrections which were possible without re-arranging its form have been made previous to publication.—W. S. K-H.)

Naval warfare concerns itself with commanding the sea, and without entering the philosophical mazes which have grown up round this matter, it will serve our purpose if we define the object of naval warfare as follows: "That we use the sea for communication, and deny its use for this purpose to our enemies."

In order to fight for the command of the sea, every nation of im portance has built a Navy, which consists of a collection of armed ships, whose armament, speed and design, vary with the resources of the age. Weapons and tactics advance hand in hand, an innovation in the one, leading to a corresponding change in the other, and *vice versa*. The weapons in modern naval warfare are of an explosive nature, such as the shell, torpedo and mine; and naval tactics aim at employing these explosives to destroy ships, for if the ship is destroyed the men are useless and helpless for the time being. The whole collection of various types of warships, designed so as to support each other is called the fleet.

The quickest and most certain way of gaining command of the sea is to destroy the enemy fleet, and this act can only be satisfactorily accomplished in a fleet action.

History affords few examples wherein both fleets were simultaneously desirous of an encounter at the outbreak of hostilities, and in certain cases neither side have wished to dare the issue of a fleet action; but usually the stronger side has sought action. It is this probability of the decisive battle in sea warfare which has caused nations to build battleships.

By the term battleship is meant the ship which lies in line of battle and concentrates within herself the maximum offensive and defensive powers, according to the weapons and tactics of the day. For the last four hundred years the battleship has been the key type of naval ship, and all other classes of ships, with one exception, have been directly dependent upon her for support, and all classes of ships have worked directly or indirectly to further the day when the ship of the line should justify her existence in battle. The one exception mentioned above, is the submarine, which can operate without the direct support of the battleship but depends indirectly upon the battleship, as the latter maintains the integrity of submarine bases. The masses of infantry in land warfare are, to a certain extent, analogous to the battleship at sea, for in the hands of both lies the ultimate fate of nations.

It will be part of our business in this essay to investigate whether the application of the principle of submersion to certain types of ships has caused the battleship to fall from her proud position. It is well to note at this point before we proceed, that in the past it has been said, and said erroneously, that the day of the heavy ships had dawned for the last time. The best known case of this was the agitation which arose in the latter part of the last century, in favour of the fast torpedo boat, which class of ship somewhat startled naval minds at that time. The school of thought that held these views flourished especially in France, where they were known as "L'Ecole de la poussière navale." They advocated the construction of a large number of fast craft carrying torpedoes, and these were to drive the battleships off the seas.

The French Government succumbed to the financial attractions of this false idea, with results from which the French fleet has never recovered. The British Government, working on the sound line of reasoning that every offensive move has an antidote, if it can be found, developed the torpedo boat destroyer. There is a well known expression in the Service which describes the mental attitude of some people towards novelties, these people are said to " go off at half cock." We must take care to avoid that error in examining the subject of this essay.

It has been said that the only decisive manner in which command of the seas can be assured is a victorious fleet action, and it is important to note that before the advent of the submersible ship one side could contain its opponent's fleet and enjoy many of the fruits of victory without fighting an action, though as long as the enemy has naval ports at her disposal, the operations of raiding on the trade routes are inevitable, since no blockade can be of 100 per cent. efficiency.

But the submarine has placed an additional weapon in the hands of the weaker power, with which it can attack the control of sea communications exercised by the stronger power.

In the Russo-Japanese war the Japanese combined operations in Korea were never impeded by the Russians, although a relatively strong force of the latter were lying close at hand ; contrast this fact with the events at Gallipoli during this war. The German submarines having broken blockade, travelled 4,000 miles and attacked our combined operations on the peninsula. Examples of the value of the submarine to the weaker power could be cited without end, they take place daily.

It has often been stated, as an instance of the difficulty of exercising complete command of the sea, that the British trade lost more vessels by the action of cruisers and privateers in the year succeeding Trafalgar than in the year preceding it ; but this was due to the enormous length of coast (some 2,000 miles) which had to be blockaded.

We had the opportunity to blockade the coast, but the task was beyond our means, and the same reasoning applies to the blockade of the Southern States in the American Civil War. But in this war the coast line of Germany is short and her ports are few, and leaving aside the influences of submarines, we could have blockaded the German ports very stringently.

The surface raiders have accounted for about 60 ships ; approximately 8¼ millions of tons stand to the credit of the submarines. It is therefore beyond question that the submarine at the present day is a very great aid to the power with the weakest fleet. What of the future ? Are our battleships, battle cruisers, and their attendant auxiliaries so much wasted money ? Are we to live with the horrible thought that in time of war we cannot protect our vital trade ? These questions and other allied ones demand an answer.

Firstly, what do we mean by " future " ? The advance of science is so rapid, and the possible technical improvements affect judgment so

greatly in dealing with the influence of a type of ship on war, that it is considered that no sound deductions can be made which embrace a period exceeding 10–15 years from this date (1918). Beyond that period we enter a field of speculative thought, in which the imagination conceives of the transmission of energy by wireless radiations, which would solve one of the greatest problems confronting a submersible ship, or contrawise we imagine the possibility of seeing under water, which would nullify the advantage of submersion.

Such speculations are interesting but not practical politics. It is worth considering briefly what has produced the submarine. Among these few and simple truths, upon which the art of war is founded, is that truth which insists on the value of surprise. History abounds with examples of the great value of surprise, from the wooden horse at Troy to the surprise Von Spee experienced when Admiral Sturdee met him with two battle cruisers off the Falklands.

Surprise pre-supposes approaching the enemy without his knowledge. Confronted with the flat surface of the sea, men considered the possibility of getting their warships under water and thus surprising their enemies by approaching them in an invisible manner. The applications of this principle have steadily developed from the crude ideas of the nineteenth century.

It would obviously be advantageous to apply the principle of submersion to all warships, if experience had not shown that up to the present, in certain classes of ships, the restrictions in design necessary for submersion, outweigh the advantages gained thereby. A submersible ship suffers from comparison with a surface craft in the following particulars. The turbines or gas engines can be used on the surface, but when submerged the present day submarine has to rely on energy stored in electric secondary cells.

This is a heavy and cumbersome method of storing energy. For example, a K class submarine can develop 10,000 horse power, giving her a speed of 25 knots on the surface for 30—40 hours; her battery gives her 2,000 horse power and a submerged speed of 4 knots for 8 hours. This class are weak in power, but an L boat can develop 2,000 horse power and a speed of 17 knots for 100 hours on the surface, but her battery only gives 1,400 horse power or a speed of 4 knots for about 20 hours when she is submerged.[1]

There are two possibilities for the future.

The battery may be improved in the direction of capacity to weight and size, or electricity may be superseded by some other form of energy.

The suggestion has been heard that submarines might be fitted with gas turbines, the gas being stored in some form of explosive. But it does not seem at all likely that the battery will be superseded in the course of the next fifteen years, and gradual improvements in the battery seem more probable.

[1] These facts are approximate. They are relatively correct.

It does not seem to be unreasonable to suppose that a ship of any size, up to say, 10,000 tons, could be made to submerge; but such a ship would be very awkward to handle under water.

The bigger the ship the longer she becomes. Long submarines can be made to dive as quickly as short ones, but as submarines generally go down partly due to their negative buoyancy and partly due to the thrust from their hydroplanes, they assume an angle to the horizontal, and the longer the boat the more water she requires for satisfactory diving. Again, once a long submarine is submerged, if she is only at periscope depth, a very slight angle will bring either bow or stern out of water.

A second consideration when designing a submarine is the depth from the keel to the highest part of the superstructure, as, if this is large, the ship requires a correspondingly large depth of water in which to operate.

A third consideration is that all lines of a submersible ship, and not only the hull lines, must be of stream line shape, in order to keep the under water resistance low.

Fourthly, the number of openings in the pressure hull, which have to be closed to dive, should be kept as few as possible. These technical considerations adversely affect the gun power of a submarine.

Fifthly, the personnel of a submarine have to be highly trained men, as in no other service does the individual shoulder such responsibility as in submarines.

Bearing these points in mind, and considering the present state of the submarine, as exemplified in the K, L, MR, UC, UB and German cruiser type, the following list contains those types of ships to which it is thought, it will be advantageous now and in the future to apply the principle of submersion.

1. Minelayers.
2. Patrol vessels.
3. Torpedo and gun firing craft for fleet action.
4. Commerce destroyers and their antidotes.
5. Coastal attack craft.
6. Aircraft mother ships.
7. Special service vessels, *i.e.*, transports and supply ships, etc.

It is noticeable that each type of ship mentioned has been used in this war as a surface ship, and that, with the exception of the aircraft tenders, these types have had their representatives in navies long before this war.

It is desired to emphasize the fact that the necessity of having these types of ships in a fleet has been long recognized, and that in this essay our object is to try and find out in what different manner and with how much additional success these craft will perform their duties if we apply to them the principle of submersion. Adding to the capabilities of a certain type of ship, that of submersion, does not alter the duties of that ship, be she mine-layer, commerce destroyer, or any other type.

What it does do, is to modify the manner in which she carries out those duties.

Before discussing the future of the various types of submarine ships, enumerated above, it is necessary to take a look at the other side of the picture, and consider the present and future capabilities of what is known as anti-submarine work. When the submarine came to the front during the present war, it was found that, whilst the submarine had been steadily developing, there had been no development, no beginning even, of anti-submarine work. In the days of peace the voices of submarines officers cried in the wilderness when they stated the potentialities of their craft. The stern facts of war bluntly announced the truth and then the German U-boat warfare opened our eyes to the peril.

Since 1915–16, great progress has been made, and, starting from literally nothing, the British Navy has built up the best anti-submarine service in the world.

All anti-submarine work falls into two classes :

(*a*) Locating the submarine when she is under water.
(*b*) Destroying her.

The present situation is as follows :

As regards (*a*) countless devices, bordering on the fantastic, have been the subject of experiment, with the object of neutralizing the power of " Surprise " at the command of a submarine. Without entering into technical details, it may be said that a certain measure of success has been obtained with instruments which detect a submarine by the sound waves she makes.

Other methods which show promise are :

Firstly, the detection of a submarine by noting the reflection from her hull of electro-magnetic waves radiated from the observing station.

Secondly, the detection of a submarine in narrow and moderately shallow waters by measuring the currents induced in a loop of wire laid on the bottom.

There are other methods still very much in the experimental stage.

What of the future ?

We must remember that progress has been fairly rapid for two reasons. Firstly, investigators started work on virgin soil and, secondly, the stimulating influences of war, and the urgency of the problem from the point of view of the British Empire, have caused the work to be pressed on. We cannot expect the same expenditure of time, money and brains in peace time. Also these instruments have only just begun to reach a stage of perfection in which they may be said to more than slightly affect the " Tactical " surprise of a submarine. Should they seriously challenge the peculiar powers of a submarine, it is quite certain that counter submarine detecting devices will develop in the natural course of events. Rudimentary examples of these, at present supposed to be in use by the Germans, are their " Oil track torpedoes " and their practice of running their motors at dy-synchronising speeds

when they are being hunted. It is admittedly largely imaginative guess work, but the writer holds the opinion that in the future it may be possible to fit large ships with instruments which will indicate the presence and possibly a fairly accurate bearing of a submarine, within a range of five miles of a ship; this is the best that can be expected, and the instruments are likely to be delicate and require skilled manipulation.

As regards the destruction of submarines when located under water, this is likely to be achieved in the future as in the present by underwater explosions. As submarines develop further they will probably be constructed in a manner which will enable them to resist depth charges with greater success than they are able to at the moment, although even to-day the modern submarine can withstand the shock of heavy underwater explosions comparatively close to her, with impunity.

It must be remembered that, even if it proves difficult to destroy a submarine owing to her strong hull, if she is located and kept blind her sting has left her, though she will, it is true, live to fight another day.

We have now discussed the technical future of the submarine from the point of view of attack and defence, and we may now examine in more detail the influence which each type of submersible ship will exercise on war in the future. Taking them in their order on the list, we have first the torpedo and gun firing craft for fleet actions.

A question immediately arises as to what prospects does the future hold for the torpedo, which has been up to the present the primary weapon of submarines, other than mine-layers, and recently the commerce destroyers.

It is shown by history that, in war and preparation for war, a perpetual struggle exists between weapons of attack and means of defence. The gun *versus* armour problem has been prominent for many years, the torpedo or mine *versus* hulls of ships has only recently received the attention it deserves, for though in the last five years the methods of attacking ships by underwater explosives have greatly advanced in efficiency, it is only at the end of this period that underwater defence against mines and torpedoes has made any progress, and as in this case defences started a long way behind attack, it is reasonable to suppose that underwater defence will advance more rapidly than attack during the next few years.

Two main methods of coping with mines and torpedoes are in use.

(*a*) By deflecting them with nets or sweeps.
(*b*) By special hull construction.

Examples of these methods in use to-day are for (*a*) the Actæon Net and paravanes. And for (*b*) treble bottoms and blisters.

Confronted with these obstacles, the torpedo will doubtless make some improvements, possibly in the direction of a weapon with a double head, the first to make a hole, the second to follow on and detonate inside the ship.

But it is a reasonable assumption that the torpedo will never again meet such easy victims as it has done in this war. Ships specially built for this purpose during this war have already shown that a hull can be constructed to stand severe underwater explosions.

If the torpedo loses much of its power the submarine will turn to the gun. We know from practical experience in M1 that it is feasible to mount a large weapon in a submarine, and such being the case we arrive at a curious parallel with land war, in that in naval war it will be possible for a commander to concentrate artillery, out of sight, and yet within range of the enemy. At first consideration it might seem that the arrival of such a submerged ship on the scene of naval war would make the battleship obsolete. But the mobility of Naval war vitiates this conclusion. This would only be so if the gun powers of the submersible ship, in conjunction with her powers of surprise, were superior to the gun powers of the surface battleship, plus her protection. It was pointed out earlier in this essay that the gun power of a submersible ship is handicapped in many ways by the technical requirements of submersion.

Taking these facts into consideration, it is suggested that, in future battles, we should be prepared to find submarine ships, with a surface speed equal to the battleship, armed with torpedoes and two large guns, the latter probably superimposed forward. Such a ship will not be heavily armoured from considerations of weight, and also because her object is not to stand up to the battleship, but to surprise the latter and then disappear again.

A battle submarine, as described above, could attack a battleship or line of battleships, either from a long range, say 10,000 yards and over, or from a close range, *e.g.*, 1,500—2,000 yards. In the first case, if she opens fire on the battleship at long range, though she offers a small target, yet with only two guns and indifferent observation, she compares so unfavourably with the battleship from the gunnery point of view, that it is questionable whether she would not be hit by the battleship before she did any damage to the latter.

It would be possible for one or more battle submarines to surface at a long range from a line of ships, fire off three or four shots apiece and submerge at once, but although this would annoy the battleships, it would not cause them serious harm, and with their superior speed above water they would quickly draw clear of the area from which the battle submarines were playing a game of long bowls, which area would at once receive the attention of aircraft and destroyers.

The close range attack seems to offer better chances of success. She might surface, fire two rounds and dive. This would take her 60 seconds from 30 feet depth.

Of these rounds, there would be a good chance of 50 per cent. or even 100 per cent. hits, because, the range being point blank, there is only a very slight difficulty of deflection, which would be quite negligible in most cases.

But, having made her effort, she would have to submerge, and if properly hunted would not be able to appear again until the fleet had

passed away from her area; also war experience shows that, provided the magazines are properly protected, a heavily armoured ship can withstand a great deal of gun punishment without succumbing.

The protection which the battleship would require against this form of attack is of two kinds :

(*a*) Internal or self-contained protection.
(*b*) External protection.

Internal protection consists of the detecting instruments which have already been discussed.

In the event of these instruments locating submarines in a satisfactory manner, the battleship could be fitted with a battery of howitzers or bomb throwers, with which to bombard the suspected area. As regards external defences, the problem is exactly the same as that existing at the present day, when the battle fleets have to be screened from torpedo firing submarines by destroyers. As no submarine can afford to risk damage which might prevent her diving, the battle submarine will dislike a destroyer's ram as much as any other submarine.

There is a possible means of defence for the battleships which is likely to develop in the future, and that is the use of large flying boats carrying torpedoes and bombs. A flight of these cruising up and down either flank of the battle fleet would make it very difficult for a heavy gun submarine to come up and fire without great risk. It does not seem as if many years must elapse before the flying boat will be capable of operating in any weather which a battle submarine could fire in. So much for the submarine in battle ; we will now consider the minelayer.

As regards the future of her weapons, the moored mine has certainly encountered a great enemy in the paravane.

Minefields are usually of two kinds, the temporary and the permanent field. The permanent minefield will always remain an obstacle to navigation, and even if surface ships are fitted with efficient gear they will hesitate to enter foul waters unless driven to do so for some important purpose.

It is noteworthy that no system of sweeps or net protection has yet been fitted to submarines, and though this may be evolved, the technical difficulties are great. There is also the question of those mines which do not operate by direct contact with a ship, but by certain other means not proper to be mentioned here. It is probable that in the future we shall hear more of oscillating mines of variou types, or it may be that a mine, whose mooring is cut, will release another which will rise from the bottom directly under the ship. At all events minefields seem destined to remain with us, and this of course presupposes minelayers.

The submarine minelayer, being concealed from sight, is suitable for employment in waters under observation from the enemy. And she should be particularly useful for laying minefields off bases used by enemy vessels which are proceeding constantly to and from sea, even though the enemy main fleet is contained. Amongst such craft

are submarine commerce destroyers, and this point is considered again under that heading.

The submarine minelayers are also suited for laying in narrow channels, where navigation is difficult, as, if circumstances are unfavourable for her to enter the dangerous area, she can lie on the bottom and wait her chance. Finally, she has the great advantage that she can dive under minefields laid to catch surface craft, as has been shown at the Dardanelles and at places in the North Sea. Her great disadvantage is the comparatively few mines she can carry compared to a surface craft of equal tonnage. The proportion at present in favour of the surface craft is about five to one.

The size of submarine minelayers cannot be increased very much if they are to be kept suitable for inshore work, as if the water is shoal, the minelayer must be on the surface when laying; and if the minelayer is not kept comparatively small, she will be conspicuous and a destroyer carrying five times as many mines might as well be used.

As regards fixing her position (a most important factor in mine laying from the point of view of safety in future operations in the same area), this is always done through the periscope if the depth of water is sufficient.

From an Imperial point of view, we must expect minelaying off our own ports if they are within striking distance of the enemy bases. This would only be a repetition of events during the present war, but in the future we shall be well advised to expect a crop of small minefields off the entrance to important ports, such as Bombay, Calcutta, Singapore, Sydney, Melbourne, Durban, Cape Town, Mombasa, etc., also in narrow passages where trade congregates, as at the Straits of Gibraltar or the entrances and exits to the Suez and Panama Canals.

These minefields would be small, but if laid by submarines they would continually be appearing in unexpected places. The possibility of submarine minelayers operating in the tropics, making use of submarine supply ships to refill and avoid returning to their base, must be allowed for.

This procedure, incidentally, would be more desirable, from the technical point of view, if submarine minelayers are used which carry the mines outside the hull, as such craft are not suited to carry mines long distances before they lay them; but in any case it is not likely that a transhipment of mines from a supply ship to a minelayer could take place in anything but the calmest sea. When considering the possibilities of these craft from the Imperial point of view, it is obvious that if we retain our present all-round superiority of Naval strength, the submarine minelayer is a weapon suited to our weaker opponent of the future. As to our defence, it should be remembered that a submarine can now circumnavigate the earth, and therefore, in time of war, all approaches to ports, narrow passages, etc., however remote from the main theatre of war, should be swept, and if possible protected by the "loop" detecting system and patrols.

Throughout all dealings with a submarine it is well to remember that a submarine officer ever seeks to justify Napoleon's maxim that "In war it is the unexpected which happens." Submarine minelayers might be used in fleet actions, but it is not considered that they are likely to play an important part, as, unless they are lucky enough to be in the correct position, they must get there on the surface, in which case they are at a disadvantage to a surface minelayer, owing to their small cargo of mines. The proper function of a submarine minelayer, during a future Fleet action, would seem to consist in mining the entrance to the enemy bases, during the interval between the passage of the Fleet sweepers and the Fleet.

Having dealt with the minelayer, we will now consider submarine patrol vessels.

It is essential in war to obtain as much information as possible concerning the enemy's movements. The old method of stationing surface ships in an area, as outposts of the main forces, is impracticable owing to the "submarine menace." This has been clearly proved in the present war.

The only remaining methods by which observation of enemy movements can be carried out are by means of aircraft and submarine patrols.

The submarine is a suitable vessel for observation work under modern conditions; she can stand any weather, though if it is very bad her observation is hampered by low freeboard, and her powers of transmitting her information by wireless telegraphy may be seriously interfered with.

Her endurance at sea exceeds that of surface craft of equal speed, tonnage and power, for, when circumstances permit, she can sink to the bottom, thus resting her personnel and economising her fuel. This advantage only holds in shallow waters, though even in deep waters submarines have rested on "strata" of water of different specific gravity, by obtaining a delicate "trim." In fine weather she can keep a periscope patrol in a proximity to the enemy which would be suicidal for a surface craft. Most important of all her advantages for this work, she is self contained. *She does not require the direct support of heavy ships.*

The advantage of this last point is obvious if a scheme be considered as to what dispositions of destroyers, cruisers, battle-cruisers, and even battleships would be necessary if it were desired to maintain close observation of a port with six sloops, or destroyers.

As far as the submarine is concerned, the heavy ships justify themselves by keeping her base inviolate.

The submarine patrols have come to stay, and they play the rôle of the inshore squadrons in the Napoleonic wars, or the observation flotillas off Port Arthur in the Russo-Japanese war, not to mention the invaluable work they have done off the German coast in this war.

The only rival of the submarine patrol is the aircraft patrol, and this is not so much a rival as an adjunct. When the size, endurance, and comfort have increased somewhat, aircraft with their horizon will be very useful as observation craft. But even if we take the case of a

large flying boat, capable of 24 hours' flight in gales, and able to rest on the water in moderate seas, the submarine patrol has one advantage denied to aircraft, namely, there is a reasonable chance that the submarine will be able to get her information back to the main Fleet, without the enemy knowing that they are being reported.

Owing to the development of directional wireless gear, the patrol submarine may have to move some way off her billet before she sends her news, or alternatively, she might send it on low power, or by sound transmission to a linking boat.

The defence against enemy patrol boats round our own bases has developed along steady and progressive lines during this war. It will probably continue on these lines, which are :—

(*a*) Patrol and hunting craft, with detecting instruments.

(*b*) Aircraft patrols, for, under certain tactical conditions, it would be extremely hard to keep a submarine patrol in being off a coast which was well provided with aircraft, especially large lighter-than-air craft. In the present war, should it last into 1919, the British patrol boats will suffer great inconvenience at the hands of the Zeppelins in the summer months, whilst the enterprise of the German seaplane is becoming a real trial to British submarines. It is regretted that the limits of space preclude a lengthier examination of the whole allied questions of aircraft working for and against submarines, which questions in themselves supply ample material for an essay.

(*c*) Minefields.

(*d*) Fixed detecting devices of the loop variety.

So much for patrol vessels of the future. The next type to be considered is the commerce-destroying submarine. The protecting of our trade in time of war has always been one of the most important duties of the British Navy. It is inevitably so, for our Empire, consisting as it does of a mass of scattered nations all over the globe, depends for its prosperity upon ocean borne commerce.

Furthermore, until the present war, upwards of 50 per cent. of the carrying trade of the world moved under the Red Ensign.

With a spirit of self-sacrifice which her own people scarcely appreciate, Great Britain in this war has sacrificed the flower of her mercantile marine on the altar of victory. But our achievements in this war have opened our eyes as to our capabilities, and it is to be hoped that one of our foremost tasks, during the period succeeding this war, will be the rehabilitation of our mercantile marine. However this may be, it is certain that the defence of trade must always be one of our great problems in time of war. That the submersible ship can ravage trade very seriously is a fact that is painfully familiar to us all. The experiences of this war have shown us that to deal with attacks on trade by submarines, a vast organisation had to be built up.

This organisation consists, at the present time, of some 5,000 craft, and still our trade is far from secure. About 20 submarines are kept at

sea from day to day by the Central Powers; that is to say, 20 boats are attacking trade which is being partially defended by 5,000 craft. This is a very striking fact, and one which has in this war, and will in future wars, affect our Empire very closely. The submarine attacks trade on exactly the same principles as trade was attacked by cruisers and privateers in the past. That is to say, the attacks are made at certain places where trade routes meet, and ships collect in large numbers in a comparatively small area.

These places have been called focal points and are of two kinds. They may be classed as local and general focal points. Local focal points are to be found at the terminal points of trade, such as the entrance to the St. Lawrence, or the Suez or Panama Canals, the Bristol Channel, the soundings between France and England, the mouth of the Thames, etc. General focal points are farther afield and are places where, for geographical reasons, trade routes narrow in. Such spots are the junction of the Mediterranean, South American and African trade routes off the Portuguese coast; the junction of the Eastern trade and the Black Sea trade in the Mediterranean; the junction of the Australian and Indo-China trade at the southern entrance to the Red Sea, etc., etc.

It is at these various focal points that the submarine commerce raiders, like their contemporary and predecessor the surface raider, will especially operate. Attack along the trade routes can never be so profitable, if the trade varies its line of approach to the focal point by 120—130 miles each side of the central routes, at irregular intervals. But the raider operating at the focal point knows that the trade must come to her.

Before discussing the manner in which these submarines will operate and the best methods of defence against them, it is desirable to forecast the type of boat we shall have to contend with. The present German submarine cruisers are the forerunners of the commerce destroyers of the future. These craft will probably carry from four to six guns of about 6 inches calibre, and half-a-dozen torpedo tubes. She will reserve her torpedoes for hostile men-of-war and very valuable large merchantmen, which are likely to be themselves well armed and also heavily escorted.

The radius of action of these submarines will be very considerable, certainly not less than 20,000 miles, a condition easily obtained if ballast tanks are used to carry fuel, and they will be equipped to hold the seas for three months at a time.

They will therefore be a formidable menace to our trade when used by a power which, by virtue of an inferior Navy, would in the past have been largely denied the use of the sea. "Largely denied" and not "entirely denied," because history shows that, however great a superiority one power has over another, the sea is so vast that the inferior power has always been able to prey on the trade of the superior power, without the submarine question being present with its additional complications; witness the heavy loss suffered by British

trade subsequent to Trafalgar, and the exploits of the "Moewe," "Emden," and other raiders in this war. But in all the above cases, whether we consider the swarming privateers of the French wars, or the German raiders of this war, our troubles were greatly aggravated by shortage of frigates and brigs in the first case and shortage of light cruisers in the second case.

The submarine, with her powers of disappearance, has unquestionably thrown a heavy burden on an Empire such as ours, of which the cement of its structure is a large ocean trade. And it is this fact, namely, the vital importance of our trade, that makes the problem of its future defence an all-important one to us.

Contrary to many expectations, the Central Powers, though controlling a large sea-going trade in 1914, have been able to support themselves for four years with this trade destroyed. It is a lesson of this war that they have done so, though opinions may differ as to whether our blockade in 1914–15 was as stringent as it should have been.

Turning to the question of "Submarine *versus* Trade," it is proposed to discuss this problem from the point of view of the "Defence" of trade, as being that aspect which is of most interest to us from the Imperial point of view.

There are two methods by which trade has been defended during war, past and present, and they will be continued in the future. One we may call the offensive method, and it consists in attacking the submarine cruisers close to their bases, and in narrow channels through which they must pass to reach the trade, and in the areas in which they operate. The other we can call the defensive method, and it consists in defending the trade when the submarine attacks it, by means of the convoy system and weapons mounted in the merchant ships, etc.

Taking the offensive method first. This is the better of the two methods, and the ideal act in it is the destruction of the bases from which the submarines set out. If the bases are situated in the main theatre of war, they cannot be effectively destroyed without the co-operation of the field army. This war has been of a very Continental nature and only (as far as an uninformed observer can judge) within the last eighteen months has the Admiralty been able to influence military strategy with a view to using the Army to strike at submarine bases. At least the attack on the Flanders ridges, which coincided with the grave tonnage situation in the autumn of 1917, is presumed to have had as one of its main objects the elimination of Ostend and Zeebrugge.

It is conceivable that in a future war the destruction of the enemy submarine bases may be the primary objective of a campaign. The menace to our Empire of the submarine commerce destroyer affords an unanswerable argument for the maintenance of a powerful expeditionary force, together with the particular study of combined operations by our officers in both services.

This destruction of enemy bases is the only complete antidote to the activities of commerce destroying vessels of any type; but this cure may prove beyond our powers of application, or fraught with too

great a measure of risk. Should this be the case, we must resign ourselves to a certain percentage of loss. That this percentage of loss will be considerable is certain, for it has been clearly shown in this war, and in the records of the activities of the Confederate cruisers in the American Civil War, that once a craft, under a skilful commander, reaches open water, she is very hard to track down, and especially is this the case when a submarine has to be hunted across the oceans.

It seems likely that in five or ten years' time aircraft will make the task of the pursuers considerably easier, as the large lighter-than-air ships will have such an enormous radius of action. The whole question of aircraft *versus* submarine in this connection is unfortunately of too big an order to be discussed in an essay of this length, in which so many and diverse aspects of submarine war must be dealt with.

If we cannot destroy the enemy's base, we must make the vicinity of the base as dangerous as possible to the submarine. This can be done by minefields, obstructions and submarine-hunting submarines, of which latter more anon. These minefields and obstructions soon lose their value if they are not protected and renewed as necessary, and the closer they are to these centres of naval activity—hostile bases—the harder it is to protect them. It is for this observing and renewing of minefields, off the enemy bases, that submarine minelayers are so useful, and the development of this craft should be kept up during peace if funds permit.

Moving further out from the ideal position of attack, *i.e.*, the enemy base, towards which all his craft must at some time converge, there is a space of sea in which it is unproductive to concentrate offensive measures.

This space lies between the vicinity of the enemy base, and the area in which he intends operating, that is to say, the trade routes and focal points. In this intervening space, always excepting narrow passages through which the enemy must pass, or would like to pass, in order to save time, any offensive measures are dispersed in intensity, and the enemy passes rapidly through the danger zone.

In the present war, the northern part of the North Sea and the Bay of Biscay have been unproductive areas. The Straits of Gibraltar and those of Otranto, the Fair Island channel, the North channel and the Straits of Dover are narrow passages worth making into offensive zones.

The great Northern Barrage has been placed where it is because at no other place can it be effectively supervised. Considered broadly, it is a continuation of the Dover Barrage, and the whole scheme comes under the heading of an obstruction in the vicinity of the enemy bases. With the exception of the narrow passages the next best place to strike at the commerce destroyer is on the trade routes and at the focal points.

It has been proved useless in the past to send ships cruising at random after a raider, witness the "Alabama" in 1863, also the "Emden" and others in this war.

The art of catching a raider is largely due to waiting where the carcase, *i.e.*, the trade, is to be found, for there also will the vulture descend. This will be even more so when the elusive submarines are in question,

for it has been assumed so far in the argument that the hostile submarines are obliged to work from their bases. The task of protecting will be magnified enormously should the enemy possess bases distributed over the world. For this reason alone, it is devoutly to be hoped that Germany will not get her colonies back at the end of this war.

Any post-war territorial re-adjustments in the Far East should be carefully considered where islands in the Polynesian Archipelago are concerned. For example, the Bismarck Islands, used as submarine bases, would be a serious menace to the Sydney—Panama or Sydney—San Francisco trades. Incidentally, in Honolulu the United States possess an ideal base from which to protect or menace trade, and in an Eastern War this place would be a big centre of anti-submarine or submarine work. If submarines operating against trade have no oversea bases, they are forced to rely on supply ships, for, provided the Foreign Office exercise pressure, there should be no difficulty with an efficient Consular service in checking un-neutral action. The submersible supply ship, which up to the present has only made a tentative appearance, will be of great value to a power which has submarines operating at a distance from their bases.

Her arrival on the scene of naval war has added to the thorns which are attached to the problem of protecting our trade in war. The type of submarine which may be expected to operate against our trade has been described; it now remains for us to consider how to cope with it when it is working on its operating ground. It must be a matter open to debate, but the writer's opinion is that the best counter to one or more submarines operating in an area is provided by submarines of similar size mounting one or more guns heavier, if possible, than the guns mounted by the commerce raiders.

The reasons which have formed this opinion are as follows. Should surface craft be used in a focal area they must be small, of light draught, speedy and always on the move, for if they stop or move slowly they will be torpedoed by the submarine, and if they are big, they will be expensive if built in quantity, and require large crews.

If they are small, speedy and of light draught they are incapacitated in bad weather, and their endurance at sea is small. Now the focal points of trade are only subject to geographical alterations by such works as the Panama Canal, and though, thanks to our numerous overseas possessions, we have bases somewhere near all the important trade routes, in certain cases the base is distant several hundred miles.

Further, as the essence of all patrol work is "Numbers," if our patrol vessels have to return to their base to fuel every ten days, we must have more ships in use, to maintain a fixed number in the patrol area than is the case if they only return every 30—40 days.

The submarine of 1,500—2,000 tons can easily hold the seas for 30—40 days, because during the day-time she can submerge and cruise dead slow, keeping watch by her periscope, or—a probability of the future—she will submerge to 50 feet and keep a hydrophone watch. At night she can patrol the area slowly and charge her batteries. If the

patrol area is subject to violent gales, this war has shown that submarines can endure any weather which a large surface ship can resist, and which would drive into port many types of small craft.

If the submarine so desires, she can always escape the sea by diving. There is another advantage to be gained by patrolling our focal areas with submarines, and that is that when the enemy raider discovers he is being hunted by submarines, it is bound to have a certain moral effect. No longer can he with safety lie on the surface at night or by day if nothing is in sight and allow his hands to bathe. His crew are always looking out for a periscope, the number of his pursuers is unknown to him, whereas after a month in an area he would have a fairly good idea of what type and how many surface craft he had to contend with, if these were his only foes.

The use of submarines to patrol an area has one slight disadvantage, and that is the possibility of regrettable incidents between our own submarines, or our trade and our own submarines. This would disappear if the recognition signals were improved beyond their present standard, and it is not really more than an objection of " detail."

A submarine for this oceanic patrol work should be specially designed for this duty. The points to which attention should be directed are :

1. She should have a heavier armament than the average destroyer.
2. She should have torpedo tubes.
3. She should be fitted with the latest form of detecting devices, hydrophones, etc.
4. A certain number should be built for tropical work, with refrigerator, special battery cooling arrangements, and good accommodation for the crew.
5. Large fuel capacity.
6. Capable of high speed for short periods, at short notices, *e.g.*, 25 per cent. increase at two minutes' notice for twenty minutes.
7. They should be so constructed that they can ram with confidence.
8. Made as handy as possible.
9. Fitted with depth charge throwers.

The latter four points are considered necessary, as the submarine cruiser, when operating on the surface, *e.g.*, at night, would desire to attack a submarine in what is one of the accepted methods for surface craft, viz., " High speed ramming and depth charges."

At the present day the manœuvring powers of the latter types of British submarines on the surface are not good, but this could doubtless be improved in these special boats whose design we are considering.

As regards bursts of speed, this could be arranged for at a sacrifice of some of the " capacity " of the battery.

We will now examine the various defensive methods by means of which trade can be defended against submarines. The methods of defence can be classed into three groups :

1. Convoy.
2. Arming our merchant ships.
3. Construction.

It is a curious fact that both the first two methods of defence, the former of which was in disuse and the latter but slightly developed at the outbreak of war, were invariably used by our forefathers in their prolonged naval struggles.

Opinion was divided as to the value of convoys in 1915, but to quote our motto, *Plus ça change, plus c'est la même chose*, and what was true in the Napoleonic wars is true to-day, for statistics of loss in this war with and without the convoy system clearly show that its advantages outweigh the arguments against it, which are :

(*a*) Concentration of targets.
(*b*) Dislocation of trade.

It is evident that nothing dislocates trade so much as loss of cargoes.

Convoying may be considered a permanency in war. During this war the convoy work has been done by all manner of craft, including sloops, cruisers, T.B.Ds., P-boats and trawlers, and air-ships. It would be more satisfactory, and worthy of the importance to our Empire of the problem involved, if a special type of convoy ship were produced, to work in conjunction with convoying air-ships. The requirements of such a vessel are :

1. She must be fast to avoid torpedoes.
2. She must have sufficient gunpower to tackle a submarine, armed with 4-inch, 6-inch, and perhaps heavier guns.
3. She should be as immune as possible from torpedo attack by reason of her construction, which, unhampered by commercial considerations, should aim at minute subdivision with blisters. She should be fitted with every form of submarine detector, which will probably take the shape of instruments too expensive and requiring too great attention to make them profitable in an ordinary merchantman.
4. She should carry two fighting aeroplanes and a kite balloon. The fighting aeroplane would be supplementary to the aeroplanes carried on the convoy airship (on top of the envelope) for her own protection. The kite balloon would be part of what may be termed the inner aerial defence of the convoy ; the big airship being the outer defence.

It should be possible to embody these requirements, together with a good radius of action, in a ship of about 3,000 tons.

It would be desirable to have one of these convoy ships for each ten merchant ships in the convoy.

These convoy ships would primarily protect the convoys on ocean passage, especially from long range guns.

Off the terminal ports and in areas where submarines could lie and wait very accurately for trade, the local patrols of small craft would have to protect the convoy from torpedo attack by screening the merchant ships in the usual manner. This latter procedure would differ in no way from the problem which has troubled us during this war.

The future holds in store the additional problem of defeating attacks on trade far out upon the ocean routes, and it is for this defence that it is considered the best defence, is a convoy ship of the type outlined above. These convoy ships would carry mails, specie and Government officials.

The next point is the armament of merchant ships. A small gun is not going to be much good, for the submarine simply remains out of range. From the gunnery point of view the merchant ship requires a gun equal in range, even if it prove impracticable to have it equal in calibre to the gun she will be attacked with. As this latter is not likely to be less than 6-inch, the merchantman's gun should be at least a long range 6-inch. Various difficulties attached to this proposal may partially disappear if the idea of a Royal Mercantile Marine comes into being. The present submarine detecting instruments are not, and are not likely to become, suitable for general distribution amongst merchant ships; but in the case of particularly valuable ships, such as big liners, it would be worth fitting them.

Smoke screens have proved their value as a measure of defence against gun attack, and, being cheap, can be supplied to all ships.

As regards hull construction, this is perhaps almost beyond our terms of reference, but there is no doubt that much can be done in producing a partially torpedo-proof merchant ship as far as the present torpedo is concerned. One last point remains, and that is the handling of convoys. It is obvious that the submarine operates under difficulties at night. In many cases the trade routes skirt the coast and daylight passages can be avoided.

Where possible submarine-proof ports should be maintained close to each other and spread along the trade routes. In addition to affording a secure haven for the convoy should a concentration of submarines be reported on the route, these ports would be a convenient base for the route patrols, and they would also provide a refuge into which a damaged ship could retire. They would require booms, nets, a wireless station, an air station, and a small yard for the requirements of the trade patrols. These ports should also have a battery to defend themselves from bombardment by enemy submarine monitors.

This concludes our examination of the Influence of Submarines on Naval War as regards the attack and defence of trade.

The subject has been dealt with at some length, because, from the point of view of the welfare and prosperity of our Empire, the problem of trade defence must always loom large in the Naval mind.

It is the writer's opinion that, taking large views, should there be an International Congress at the conclusion of the present war, to discuss disarming the nations, then the influence of the British representatives should be directed towards securing the total prohibition of construction of submersible ships.

The mantle of prophecy was on the shoulders of Lord St. Vincent when he endeavoured to discourage submarines at the beginning of

the nineteenth century because of the menace they foreshadowed to our above-water supremacy.

Returning to the list of submarine types, the next in order for consideration is the " Coastal Attack " craft. Such craft will be constructed by the weaker power who desires to use gunpower from the sea, at places to which her surface craft cannot proceed unless they win a Fleet action.

Provided we maintain our present superiority, there is no call for us to construct these submersible monitors, for such they will be. Though it is easy to imagine uses for them from our point of view, they cannot be classed as essential construction.

But the Empire is peculiarly liable to attack by this type of craft. Scattered over the seven seas we have many small bases, coaling stations, wireless, cable stations, and commercial harbours. All these are liable to sudden attack by a pair of heavy guns emerging from the sea.

Opinions as to the value of fixed defences on land to protect the coast have fluctuated considerably during the past ten years. But to anyone who has served within range of the German batteries on the Belgian coast, the ability of heavy guns to protect a coast seems very considerable. It is suggested that isolated bases and ports of value should be protected either with a battery of about four heavy guns, or a squadron of bombing seaplanes. Lesser ports and bases should rely on the anti-submarine patrols which may be based there, and possibly observation minefields. It seems desirable to point out that it would not be a sound policy to endeavour to protect a harbour with a submarine monitor. The guns would not be so well controlled, nor would they be so efficiently handled as if mounted ashore; and camouflage and disappearing mountings ashore are fully equal to the fact that in a submarine the guns disappear under water.

It may be objected that a policy such as is outlined above of protecting many harbours with batteries is likely to be expensive in personnel and material—to which objection the writer would reply that thousands of heavy guns suitable for this task will come back from France, and that throughout the British Empire, for the next twenty years, there will always be found many men with adequate military training.

So much for the submarine in coast defence and attack.

* * * * * *

The next type of craft on our list is the submersible " aircraft mother ship." As far as we know the principle of submersion has not yet been applied to seaplane mother ships, but there seems no logical reason why it should not be so applied in the future. It depends on the development of aircraft. It would surprise no one if an aeroplane flew the Atlantic to-morrow and, such being the case, it does not require much imagination to visualise a machine with a radius of action of 2,000 miles, armed with machine guns, a twelve-pounder cannon, and manned by a crew of ten men, capable of flying in a gale, and riding on a sea of a force up to " 4."

This craft would probably be beaten off if she tried to attack a convoy by the fast fighters carried in the convoy ship, but she would make it very unpleasant for an isolated merchant ship.

The offensive powers of this craft would be materially increased when operating in oceanic waters if she had a base to return to, within easy reach of her hunting ground. If she has no oversea bases, the defect may be partially remedied by the submarine mother ship.

The *modus operandi* of such a vessel might be of this nature: She would leave her home port, carrying two or three large seaplanes in parts, with fuel, spare parts, mechanics, pilots and crews. She would proceed to her billet; we will suppose it is to be the Eastern part of the Indian Ocean. Selecting one of many uninhabited islands and atolls, she would establish a temporary base, and operations would commence. From week to week the base would shift and a glance at a map will show that in a month's time the mother ship, travelling East, would have reached the mass of islands, atolls, and inlets in and about Borneo and the Melanesian Sea.

Here it would be arranged for her to meet a supply ship which had come with replenishment of stores straight from the mother country, and, thus reinforced, operations would start again either in the North Pacific or South Pacific Ocean. Eventually the seaplanes would be dismantled, and the mother ship would return at the completion of a six to nine months' cruise.

With the assistance of submarines supply ship, stores from ships captured by her aircraft, and the assistance of a ship or two from the neutral ports, or even a surface supply ship from the home base, she might easily have circumnavigated the world during this period. Four years ago, such an outline of possibilities would have seemed suitable as the synopsis of a sensational novel, but to-day it seems well within the bounds of possibilities during the next few years.

The bulk of our trade would rely on the convoy system for protection against this mode of attack. Isolated ships would have to rely on their own gun power, and in this respect it would be well if guns fitted to merchant ships of the future be of such a nature that they can be used as aerial weapons as well as for their ordinary duties. Another form of protection could be afforded by seaplanes and airship stations spread along the trade routes. In peace time these chains of Imperial air stations could be employed for the Empire mails and fast passenger traffic.

Finally we reach the end of our list with the group of types which are included under the heading "Special Service Submarine Ships." These comprise:

1. Submarine supply ships.
2. Submarine transports.
3. Commercial ships.

No. 1 was mentioned in the section of this essay dealing with the defence of trade. The importance of the submarine supply ship lies

in her value in increasing the striking powers of a submarine fleet which belongs to a country without overseas bases. This type of submarine ship is of no use to us, generally speaking, and constitutes an additional grave menace to our trade. The only circumstances under which it might be useful to us, are those in which we had submarines operating in waters over which the enemy had complete surface control, and which were far removed from any of our bases. This state of affairs is practically impossible when the geographical distribution of the Empire is considered.

The use of submarine transports is a possibility of the future, but not a very serious one from the British point of view, owing to the small number of men which could be carried. It would require ten to fifteen submarines, about twice as large as the largest existing boats, to transport 1,000 men a maximum possible distance of 1,000 miles. The only use that could be made of such boats would be to land small parties on isolated undefended points, and this could probably be done equally well by a proportion of the crew of an ordinary commerce destroying submarine.

Lastly, commercial ships. These would only be used to run through a strict blockade when a small, valuable and essential cargo was required by the blockaded party. Owing to the expense, lack of cargo space, etc., it is not commercially sound to apply submersion to ordinary cargo carrying vessels.

General Conclusions.

Since completing the body of this essay, the present war has been brought to a victorious conclusion, and a Peace Conference is about to meet.

In discussing the influence of submarines in future Naval warfare, it is difficult to ignore the fact that all the probabilities are that there will be no future war during the next ten or fifteen years, which period it was considered was the limit within which sound deductions could be made.

But, arguing on the assumption that such a catastrophe as a great war within fifteen years is at all events a possibility, certain conclusions have been arrived at.

In the first place it is considered by the writer that this war has shown in its latter stage that, for the purpose of tactical attack on surface ships of war, the submarine has fallen back from the position of undue power which it occupied in 1914–1915—" Hogue," " Aboukir," " Cressy," " Hawke," " Hermes," " Pathfinder," " Formidable "—to its proper place in the Naval scale of precedence.

It rose to a position of great power in the early days of war because, whereas the problem of underwater attack had been studied for a considerable number of years, that of defence against underwater attack, and that of " offence " against submarines had been completely neglected.

Tactically, it will always remain a menace to surface ships and oblige those of any importance to move about behind screens, in exactly the same manner as a battle-fleet protects itself by a screen from a destroyer attack at night.

Strategically, the situation is different. A flotilla of submarines represent a concentration of armed force and the fact that this concentration can emerge and disappear from sight is an important point, from the strategical point of view.

In our past wars, notably of the Napoleonic era, our problem frequently consisted in preventing the departure from France of squadrons destined to act either against our trade or colonies in distant waters.

In a future war, we must be prepared to find concentrations of submersible cruisers suddenly appearing on the distant trade routes. To use an American expression, unless we are very fortunate in our intelligence, we may be " left guessing," in the opening stages of the war, as to where to expect a commerce destroying force to appear, though it is sure to be on one or more of the focal points.

This consideration brings us to the last and most important conclusion, the future of our trade as regards submarine attack. Inspection of the latest type of German submarine cruiser confirms the writer's belief that the craft of which these are the forerunners will be a very grave menace to our trade. If Germany had possessed 200 ocean-going submarines the course of the war might have been very different.

We are the only great power that is absolutely dependent on sea trade and oversea supplies for our existence month by month, apart from any question of carrying on a war. The greatest menace to this trade, or rather the menace which is hardest to cope with, is the submarine. It would be greatly to our advantage if all submarine construction in time of peace were prohibited—our enemies might start building submarines as soon as war started—it is even possible they might have parts available and only needing assembly, but crews would have to be trained and in any case we should gain " Time "—so all-important a factor in war.

The prohibition of submarine construction may be an Utopian idea, in which case the essential thing is that the British nation and the politicians should realise the existence of this menace, and prepare in peace for war.

Of British sea power in all its forms and of the Empire which it protects may it be always said, *Plus ça change, plus c'est la même chose.*

THE BEGINNINGS OF SUBMARINE WARFARE.

By Colonel C. Field, R.M.L.I.

" (For near a spacious river's bank we stood)
A bark emergent rose; with oars well-tim'd,
Cut the smooth wave, and o'er the surface skimm'd;
Then sunk again, but still her course pursu'd;
Clear was the stream, and all beneath we view'd."

—*From " The Scribbleriad."*
By Richard Owen Cambridge
(1718-1802).

PRIOR to the recent great war, submarine navigation had never developed beyond an initial stage. But the idea of attacking an enemy's ship from under water can be traced through the Middle Ages right away back to classical times. The forms of attack may be roughly divided into three:—

1. Individual attack by divers without any apparatus.
2. Individual attack by divers provided with some primitive contrivance for the supply of air while under water.
3. Attack by submarine boats.

Before proceeding to consider the little that history has to tell us about these early attempts at under-water warfare, it may be stated at once that, up till quite modern times, some of these forms of attack remained, as far as can be ascertained, little more than projects, and even the few statements that have come down to us of actual submarine attack must be received with the proverbial grain of salt.

We know, from many authentic accounts, that pearl-divers can dive to a considerable depth and remain under water for an astonishing time without the use of any apparatus other than the lungs with which nature has provided them. In the Pacific Islands, where children learn to swim almost before they can walk, it is a common accomplishment to be able to swim for a considerable distance under water. So when we read of the feats of the divers of antiquity I think that we may accept at least a modicum of these accounts as having a basis of fact.

Thus there is no inherent improbability in the story of the effective operations of the divers of Tyre against Alexander the Great when he laid siege to their city in the year B.C. 332. His ships, when anchored off the city, had their cables cut by the enemy's divers and were set adrift, and when he endeavoured to " bottle up " the harbour by a huge stockade or breakwater these expert submarine warriors contrived to destroy it.

One of the most famous of such divers was Scyllis of Scyone, some of whose exploits are recounted by Herodotus. He first appears as a diving expert in the army—or navy—of Xerxes when he set out to conquer Greece. Whether that monarch got any good out of him is doubtful, for it is related that he deserted to the Greeks and brought about the destruction of many Persian vessels. Taking advantage of bad and stormy weather, he and his daughter Cyane—an equally accomplished diver—approached the Persian Fleet, and, diving and swimming under water, the pair contrived to cut the cables of several ships which the gale then drove to destruction. According to Pausanias, this famous exponent of the art of diving, when he deserted from the Persians, swam no less than eighty stadia under water, from Appetæ to Artemisium. As a stadium was equal to 606 feet 9 inches English measure, this would mean something over eight miles! I do not think we need try to swallow this part of the story. Herodotus says that *his* opinion is "that he came to Artemisium in a boat."

Thucydides takes us even farther back. He tells us that at the celebrated siege of Syracuse, in B.C. 415-413, the stockade which defended the harbour was removed by the Athenian divers. These men cut through the timbers of which it was built close down to the bottom, causing them to float up to the surface, where they were towed out of the way by a party working from a specially protected raft.

The Romans, it is said, actually had a corps of "Urinatores," or divers, but I have not been able to find any account of their use in submarine attack.

Philon, a Jewish writer born in Alexandria about 20 B.C., seems to have written a treatise on the use of divers in naval warfare. After suggesting the obvious fact that it was easiest for them to carry out their attacks under cover of the darkness, he puts forward the suggestion that they should not only employ the old tactics of cable-cutting, but should use augers to bore holes in the bottoms of the enemy ships.

This sounds a very tough proposition, but, whether or no it was ever carried into effect, we find plenty of references to this form of under-water attack all through the Middle Ages, and even in the 17th century. As late as 1841 it was considered a feasible project by the Chinese, for, according to an officer on board H.M.S. "Nemesis," then engaged in operations off Canton, "several hundred divers were said to be in training, who were to go down and bore holes in our ships at night; or even, as the Chinese privately reported, to carry down with them some combustible material which would burn under water and destroy our vessels."

The latter form of offensive would appear to be almost chimerical —to "set the Thames on fire" might seem to be easier, yet, if we may believe an old historian, a heavy stockade in the Seine was destroyed by similar means in 1203. "An engineer named Gaubert," he writes, "a native of Mantes, found out how to keep alight, even under water, a kind of firework contained in earthen pots without any covering; and, as he also shared, with certain divers, the accomplishment of being able to cross a fairly wide river, swimming under water, he made use of this secret to set on fire the big stockade which defended

the approach to the Island of Andelys, which the army of Philip Augustus was attacking, and which he took before laying siege to Château Gaillard. For, whilst the enemy were making an assault upon the bridge which this prince had thrown across the Seine, and the whole attention of the besieged was concentrated upon this spot, Gaubert swam under water with his earthen pots full of fireworks, and, having reached the stockade, he set it instantly in a blaze. As the boats were all in readiness to transport the soldiers to the island, it was surprised on this side, and the garrison of the castle was obliged to surrender."

But to return to the use of the auger. In mediæval times this system of submarine attack was considered perfectly practicable. In a code of maxims, or rules, for the carrying out of naval engagements, which was universally known to the sea-warriors of those times, we find the following:—

"Let your divers with augers pierce the ship's sides; in order to hasten her destruction you must hurl great stones at the spot where the water is coming in." Valturius, a celebrated writer on warfare in the 15th century, recommends the same procedure, and in the French Navy, in the reign of Charles V., among the complements of its men-of-war, were "*seamen who know how to swim under water,*" and it is stated that these were the men who, being expert in the use of the instruments called "Perçoyeurs," had the duty of scuttling an enemy's ship. When we come to consider early efforts in the direction of submarine boats we shall again find references to the use of the auger.

The form of attack remains as a tradition to the present day in the well-known ballad or "chanty," "The Golden Vanity." There are innumerable versions, but the gist of the story is that, it being necessary to sink an enemy galley—variously described as French, Spanish, or Turkish—the captain of an English ship—generally supposed to be Sir Walter Raleigh—offered a "store" of silver and gold and his daughter in marriage to anyone who would carry out the job. The "little cabin boy" volunteered for the desperate attempt. A modern version goes on to relate that—

> "Then the boy bared his breast and straightway leapéd in,
> And he held all in his hand an *Auger* sharp and thin;
> And he swam until he came to the Spanish ga-la-lin,
> As she lay by the lowlands low.
>
> "He bored with the *Auger,* he bored once or twice,
> And some were playing cards, and some were playing dice;
> When the water flowéd in it dazzléd their eyes,
> And she sank by the lowlands low."

It is interesting to find that, in a very old version called "Sir Walter Raleigh sailing in the Lowlands,"[1] it is stated that—

> "He had an Auger fit for the nonce,
> Which will bore fifteen good holes at once,"

[1] In this version the ship is called "The Sweet Trinity."

while in another probably slightly later version we are told that before the boy went overboard, "they sewed him up tight in a black bull's skin," and that when he took out his *Auger* he "bored thirty holes at twice." One wonders whether in mediæval times divers really were provided with instruments capable of boring more than one hole at a time. Fifteen, the number mentioned in both the last-quoted versions, is of course out of the question. In yet another version the hero died when he got back on board his own ship, and it was *then* that—

"They sewed him up tight in a black bull's hide,
And they hove him into the sea to go down with the tide."

Cable-cutting tactics were, however, not lost sight of. At the siege of Bonifacio by the Spaniards in 1420 the heavy boom, protected by five anchored ships with which they had closed the harbour mouth, was broken by the ships of a relieving squadron, which engaged the five defending vessels. "At length," to quote an old writer, "a skilful diver, armed with a helmet on his head and a scimitar slung to his side, threw himself into the sea, and, swimming under water to the enemy's ships, cut their cables; which, being thus loosed, fell foul of one another with great destruction."

We will pass now to the earliest accounts of special diving dresses and similar apparatus for enabling divers to stay longer under water than was possible when they had to depend only on the staying power of their lungs.

To the exploits of certain divers at the siege of Tyre by Alexander the Great we have already referred. According to Aristotle, some kind of air-supplying apparatus was also used upon this occasion, which he likens to "the trunk of an elephant." Pliny, too, has a story of some of a very similar nature, while centuries later the celebrated Friar Bacon, who seems to have been something between a wizard and an early scientist, wrote that apparatus *could* be made to enable people to walk under water, and asserts that "such instruments *were* made in ancient days, and also in our own times."

When Acre was besieged by the Crusaders a submarine apparatus of this kind was the means of getting a diver into the city with a message from the outside world, if we are to credit the account of Bohaddin, an Arabian historian, who lived about 1150. We find very queer pictures of what purport to be diving dresses in manuscripts of the Middle Ages and in one of the earliest printed books—Valturius' "Art of War." Referring to the quaint wood-cuts in the latter work, a modern French authority has written:—

"The warriors of the sea were always distinguished for their intrepidity and boldness, and it is easy to believe that from them emanated the systems of maritime warfare that in the 15th century gave birth to a series of extraordinary inventions in nautical weapons."

The earliest picture of a diving dress that I have been able to find occurs in a 14th century MS. in the Imperial Museum at Vienna. The helmet, or head-piece, is supposed to be of metal and is apparently provided with glazed eye-holes. The rest of the figure being painted

black is taken to mean that the dress was made of leather. In order that no one should make any mistake as to which part of the picture the artist intended for water and which for terra firma, he has introduced various fishes and quadrupeds. The black colouring, to denote leather, is also used in a drawing of a couple of under-water warriors which is—or was—at Castle Ambras, in the Tyrol. Curiously enough in none of these three figures is there anything indicating a tube communicating with the surface, though one of the latter is equipped with a gourd or flask which may be supposed to contain air.

Valturius has a couple of wood-cuts of divers, one armed with a mace and shield and dressed in an ordinary warrior's helmet, and a costume probably intended to represent leather. The other has no apparatus except a flask, presumably containing air. He also gives a picture of what is stated to be a diver's helmet. In the background of this picture appears the figure of a man armed with a battle-axe and wearing a similar kind of head-dress. He is an active fellow, for he has caught a fish with his hand, although—strange to say—his helmet has no holes for the eyes.

Neither has the helmet in the fore-ground. What is the explanation of this remarkable omission? If a guess may be hazarded, the answer is that Valturius was copying from and endeavouring to improve on the drawing in the manuscript of the previous century that has been already referred to. For in that MS. there is another drawing of a *swimming jacket* provided with a tube for its inflation which is practically the facsimile of Valturius' diving helmet. Place the two side by side and one cannot but come to this conclusion. The only difference is in the straps and buckles. In the original drawing the oval part of the jacket was to be applied to the breast, the rectangular part to the back, and the two strapped together. When inflated, by blowing into the leather tube, the jacket would enable the wearer to float, but he could dive under water if he allowed the air to escape. It is the same idea as that depicted in an ancient Assyrian carving at Nimrud; but more elaborated. Now it is suggested that Valturius, having determined to annex the picture for his book as an illustration of a diving helmet, eliminated the buckles on the oval portion and put a couple of them on the straps of the lower part to give the idea that they were for the purpose of fastening it to the rest of the diving dress. But, strange to say, he hestitated to make the necessary and obvious addition of eye-pieces.

Writers of somewhat later years probably copied their diving suits from Valturius' wood-cuts, but supplied the deficiency by adding eye-holes. They probably said, as did the Chinaman when asked why "eyes" were always painted on the bows of a junk, "Suppose no have eye, how can see?" Such pictures appear in a work by Ludwig von Eybe zum Hartenstein, published early in the 16th century, in a work on gunnery by one Diego Ufano, published in 1613, and in "*Metaphysica, Physica atque technica Historica,*" by Robert Flud, published in 1617. In the picture of a diver crossing a river in the last mentioned, the air tube leads directly from the diver's mouth,

but from the position of the figure we cannot tell whether the author intended that he should be able to see or not.

It seems quite possible that such diving dresses never really existed before the 17th century, except in the imagination of various authors and artists. For, prior to Luttrell's account of an experiment with a diving helmet invented by the Duke of Schomberg, there appears to be no definite record of such an event. Wearing this apparatus, a man, he says, walked some way along the bottom of the Thames on September 7th, 1692. Moreover, the celebrated Leonardo Da Vinci, from whose fertile brain proceeded many inventions and suggestions for mechanical apparatus, of which he left a great number of drawings, seems to have made only one suggestion to facilitate the work of divers, the apparatus proposed being merely a hollow bamboo, the lower end of which could be fastened tightly to the mouth, while the upper was supported by a circular float. Had such diving dresses as those referred to by Valturius had an actual existence, Da Vinci was not a man likely to be in ignorance of the fact, and would hardly have put forward such a primitive invention as his bamboo tube.

Having dealt with early diving and diving dresses, we come now to the inception of the submarine boat. The way in which Alexander the Great was hampered by the divers of Tyre has already been referred to, but he himself is also said to have employed divers for warlike purposes. Moreover, if we may give any credence to legends which were, in mediæval times, prevalent in Europe, and are even to-day recounted in the villages of India, he not only took an interest in submarine matters, but he himself descended to the bottom of the sea in a closed vessel variously described as a Glass Barrel, a Glass Globe, and a Glass Box or Cage. There are innumerable mediæval MSS. giving what purport to be true histories of Alexander, and his descent into the depths of the sea forms the subject of many quaint illuminated pictures. In India, to the present day, he is always referred to as the "Two-Horned Alexander," and, curiously enough, in some of the monkish MSS. of the Middle Ages, though he is not personally adorned in this way, his charger *is*.

One of the earliest accounts of his submarine adventure is to be found in an Ethiopian version entitled "The History of Alexander. Belonging to the Holy Saviour of the World." According to this, "he went into a cage of glass which was covered with asses' skins, and which had an opening which was closed with chains and rings, and he took with him such food as was needful—and took two of his friends with him." He told his friends that he expected to be away for 100 days. "At the end of 70 nights," goes on the chronicle, "God commanded the Angel who had charge over the sea, saying, 'Everything that the Two-Horned shall command thee, hearken thereunto, and take and deliver him from all evil, and keep every evil thing away from him and everything which can terrify him in the billows of the sea.'"

The angel seems to have arrived in the nick of time, as "the ark in which the Two-Horned was sailing" was beginning to be broken up by the sea.

The angel, having secured Alexander's safety, went on to ask him whether he would not like to see the wonders of the deep, and on his reply, "Yea, my lord and messenger of God Almighty," proceeded to call up what was apparently our old friend the sea serpent, or rather a succession of him. Even the first monster beat all modern records. He was a regular procession, since Alexander sat watching him pass for two days before he saw "the tail and hinder parts." "What do you think of that?" said the angel, and, Alexander having expressed appropriate amazement, he proceeded to summon Sea Serpent Number 2. This one was "black as a cloud"—and passed quite close. It took Alexander two days and two nights to see the end of *him*. However, the angel said that he would go one better even than this, and brought up another monster. "Pass thou by the Two-Horned quickly," ordered the angel, "like a flash of lightning." Even at this speed he took three days and three nights to pass the patient Alexander, who, one would imagine, must have been bored to death by this time, and presently, after some further conversation, he must have been greatly relieved when the angel said, "'Lift up thine head that thou mayest see a wonderful thing,' and he lifted up his head and behold he was nigh to his troops who were in a ship."

There are also one or two Greek versions of the story, one of which says that Alexander's real reason for exploring the depths of the sea was to get pearls—a more business-like theory, which may have had a foundation in fact.

A typical mediæval version runs somewhat as follows:—

Alexander ordered his "cunning men" to make him a box of "great sheets of green glittering glass" bound with "great girths of iron," and to "bind great chains to it." It was then taken to sea in a boat, and Alexander, getting inside, "quickly shut the wicket, and his princes painted it with pitch so that no water might come in at the joints, and in a moment he entered the deep with a heavy plunge. There he saw fish whose figures he had never dreamed of, with forms diverse and horrible, and creeping things and four-footed things crawling on the sea bottom, and feeding on strange fruits of coral and sea-weeds and trees growing on the sand and sea-ooze. Great monsters came sailing up to the sides of the cage and looked in and turned away affrighted, and other sights he saw such that he would never tell to any man till the day of his death, for they were so horrible that tongue could not tell or man hear them told and Alexander fell down on the floor of his vessel of glass and lay there for a time without life." The enterprising monarch was nearly coming to grief altogether, for one of his friends in the boat inadvertently let go the chain. Overcome with horror at his carelessness he threw himself overboard that he might die with his master. However, as luck would have it, the heavy chain fell on and smashed the glass box, and, miraculously escaping both the heavy chain and the broken glass, Alexander shot up to the surface and was rescued.

If we except a story that Lucullus sent a messenger from a besieged port in a distended goat-skin,[1] in which the blockading fleet mistook him for a fish, the earliest mention of an actual submarine boat occurs in an old German poem entitled "Salman and Morolf," dating from about 1190. It is, of course, a romance only, but the idea is there definitely enough. The story deals with the adventures of one Morolf, a conjuror, who had incurred the wrath of King Solomon. A price being put upon his head he escapes from that sovereign's fleet in a leathern boat caulked with pitch, which enabled him to disappear beneath the waves. As the boat was supplied with a long air-tube, he contrived to lie snugly at the bottom of the sea for a whole fortnight, by which time, presumably, the pursuit had blown over. It is a pity that the picture of this early conception of a submarine, which formerly adorned the MS., has been cut out and lost. It would have been interesting to have seen the 12th century idea of a "U"-boat.

The next reference to a submarine boat that I have been able to find occurs, not in a romance, but in Olaus Magnus' account of Scandinavia, written about 1555.[2] This writer, who, by the way, was Bishop of Upsala, declares that he had seen two such boats himself. This is what he says: "There are pirates in Gruntland (presumably Greenland) who make use of skiffs and boats constructed of leather for the purpose of going wherever they wish, either above or *below water*, and by their means they pierce and make great holes in passing merchant vessels. In the year 1505 I saw two of these leathern boats or skiffs in the Cathedral Church of Asloe, in the Western porch. They were dedicated to St. Haluard, and are said to have been taken by King Hakon while passing with his warships along the coast of Gruntland, when the pirates, by their wickedness, tried to sink his vessels." The Bishop probably wrote in good faith, but I strongly suspect that the boats he saw were kyacks, such as are used by the Esquimaux. The wood-cut[3] which he presents as an illustration, goes far to prove this theory. The boats are distinctly of kyack shape, there is no indication of submergence, and for concealment—very partial concealment at that—the redoubtable pirates rely, apparently, on a "camouflage" composed of what looks like bunches of reeds. These "bunches" *may* be intended for shields, but though placed as shields usually were in mediæval times, I have never seen a shield of their shape or appearance in any other drawing, illumination, or wood-cut.

Diving bells were invented about this period, if, indeed, they had not a much earlier existence among the ancients. But these were not intended, or indeed suitable, for offensive submarine attack. But Sir Francis Bacon, in his "Novum Organum," after describing a diving bell, adds: "I have heard also of a sort of machine or *boat* capable

[1] Can there be any connection between this story and the "black bull's skin" in the ballad of "The Golden Vanity"?

[2] "Historia de Gentibus septentrionaux."

[3] "De nauibus insidiosis" is its title.

of carrying men under water for some distance." To what particular invention he refers is unknown, but there were two or three projects for submarines before 1620, the date of the first edition of this work, not counting the "insidious ships" of the Gruntland prototypes of our modern Huns. The Venetians are said to have used a submarine vessel to raise a galleon which had sunk in the Roads of Malamocco in 1559. Whether this "vessel" was a boat or merely some kind of diving bell or caisson is uncertain. In 1578 William Bourne, who had served in the Navy as a gunner under Sir William Monson, published a book called "*Inuentions or Deuises—Very necessary for all Generalles and Captaines, or Leaders of Men as wel by Sea as by Land.*" In this little work we find set out at some length an Elizabethan seaman's conception of a submarine boat. "It is possible," he says, "to make a shippe or boate that may goe vnder the water vnto the bottome, and so to come vp againe at your pleasure. Any magnitude of body that is in the water, if that the quantity in bignesse, having alwaies but one weight, may be made bigger or lesser, then it shall swimme when you would, and sinke when you list." The description of the suggested submarine which follows is extremely verbose and somewhat involved, but it may be shortly described as being a small boat or "Bark," as he terms it, divided into three horizontal compartments or decks. The lowest one contained a good deal of ballast to reduce the flotation. The centre one had, apparently, water-tight bulkheads fore and aft. Between these bulkheads, the sides of the vessel were pierced with a number of holes for admitting the water. At the surface these were closed by a movable inner side which was held close up to the side proper by "A prouision of skrewes or other engines."

When the boat was to submerge these bulkheads were withdrawn towards the centre of the vessel, the water poured in, the displacement was altered, and she sank. There were waterproof leather connections, probably like the sides of a bellows or of a concertina, between the ship's side and the movable bulkheads, so that the water could not penetrate into the body of the vessel. To come to the surface, the procedure was to be reversed and the water expelled. There was a hollow mast for the provision of air when under water, and the inventor wisely suggests that "you must sound the deepness of the water and foresee that the water will not rise higher than the top of the mast." Access was obtained to the interior of the boat by "a hatch or skotel," which was to have "leather round about it, that you may bring it together as a purse mouth, and so with a small skrewe you may wind it so close together . . . . that there shall no water come in." No system of propulsion is suggested, nor any means of egress for divers when at the bottom. So it is rather difficult to imagine what William Bourne intended his boat to perform. In 1596 we find a Scotsman, Napier of Merchistoun, claiming to have invented a submarine boat, but he gives us no description in support of his claim. He merely makes the statement that he had made four "Secret Inventions, profitabil and necessary in their dayes for defence of the Iland and withstanding of strangers, enemies of God's truth and religion, besides

devices of *sailing under water,* with divers other devices and stratagems for the burning of the enemies, (which) by the Grace of God, and work of expert craftsmen, I *hope to perform.*" A vain hope, if not a vain imagining.

But now at last we come to an actual submarine, really built, and which seems to have been able to travel under water for a short distance. The inventor of this early under-water craft was a Dutchman, Corneilius Van Drebbel, of Alkmaar, who is said also to have devised an "engine of perpetual motion," and to have had something to do with the invention of thermometers, microscopes, and telescopes. He is reported to have constructed two submarines, one larger than the other, about the year 1620, which were launched on the Thames. They were built of wood, strengthened inside with iron bands, and covered externally with tightly-stretched hides soaked in grease.

The larger one pulled twelve oars which passed through holes in her sides, and were made water-tight by leathern sleeves attached both to the oars and the vessel's side. According to one account the balance between flotation and submersion was so fine that she could be kept below water by the oars alone, presumably used in the same way as the diving fins of a modern submarine. But another writer asserts that she was sunk by admitting water into tanks, and raised by dropping ballast. Possibly both systems were employed in concert. The same author states further that she was equipped with our old friend the auger, working in a stuffing box, and with torpedoes carried at the end of long poles. According to the "Chronicle of Alkmaar," published 1645, Van Drebbel "built a ship which one could row and navigate under water from Westminster to Greenwich, the distance of two Dutch miles; even five or six miles, or as far as one pleased. In this boat a person could see, under the surface of the water and without candle-light, as much as he needed to read in the Bible or any other book." Drebbel also invented what he called a "certain Quintessence," or chemical liquor, by which he was enabled to renew the air in his boat when it had become vitiated. It is even said that King James I., cautious as he was of his Royal Person, ventured on a submarine trip in Van Drebbel's under-water boat, and was so pleased with the invention that he had a replica built for presentation to the Czar of Muscovy.

It seems probable either that these two boats of Drebbel's, or other similar ones, were used against the French at La Rochelle in the Expedition of 1626. For instructions were given on January 26th of that year for Sir William Heydon, the Lieutenant of the Ordnance, to make "dyvers water mines, water petards, fforged cases to be shot with fireworks, and *boates to goe under water.*" I cannot help thinking that Drebbel must have been responsible for these. Then, on June 29th, comes an order from the Duke of Buckingham, who was to command the expedition, for these articles consisting of "360 fforged iron cases, with fireworks, 50 water mines, 290 water petards, and *two boates to conduct them under water.*" We have no description of the boats or their subsequent use at La Rochelle, but we have the following account of the "Floating Petards": "The composition of

these petards was of lattin (an alloy of 60 parts copper, 30 zinc, and 10 lead), filled with powder, laid upon certain pieces of timber, crosse which there was a spring, which touching any vessel would flie off and give fire to the petards." These embryo torpedoes were a dead failure. One succeeded in striking an enemy ship, but its explosion did nothing more than "cast water into the ship." Of the rest some were captured by the French guard boats before they reached their objectives, while one of them blew up prematurely as it was being dropped into the water from an English boat, killing a Captain Allen and seven of his men.

If the development of the submarine had stopped—as this brief account must do—with Van Drebbel's boats and the futile attack on La Rochelle, it would have been well for humanity. The perfected submarine has proved itself of comparatively little value in actual and recognized warfare. As an instrument for the murder of defenceless seafarers in unarmed or inadequately protected merchant ships it has, in the hands of the Huns, disgraced civilization by a series of crimes unparalleled in the history of the world. But against war-vessels equipped and prepared to deal with the submarine menace, it has been a failure. What successes it has gained against men-of-war have nearly always been under exceptional circumstances. At the beginning of the war the knowledge of its presence had some moral effect in keeping a certain number of surface ships in harbour, but latterly it was the submarine that feared to operate where warships were about and on the look-out for it. These, with the assistance of airships and aeroplanes, rendered the existence of an enemy submarine a most precarious one. The Peace Conference is said to have banned the construction of submarine craft or their use in war. If it is able to enforce its decree it will be all for the good of humanity, since such vessels are of no value to peaceful commerce.

The quaint craft illustrated is supposed by some writers to have been intended for submarine navigation, but it will be observed that no claim for submersibility is advanced in the description which is subjoined. Indeed, if we may credit a contemporary Dutch writer, it is very doubtful if the vessel was ever afloat. Its launch, he says, was arranged for July 6th, 1654, but at the last minute De Son announced that she would not be ready in time, as he was waiting for some piece of the ironwork. "Apparently," says the writer, "he never was able to find it; at any rate no more was ever heard of him." The date of this boat is somewhat later than the period covered by this article, but it is interesting as being the earliest picture now known of a possible submarine vessel.

NOTES ON THE HISTORY OF BOULOGNE AS A MILITARY MEDICAL BASE.

By Lieut.-Colonel Guy N. Stephen, R.A.M.C. (T.C.).

(*Continued from page 287.*)

The Third Phase.

As already indicated, the third phase began about the middle of 1915 and lasted until the beginning of 1917.

Among the earlier changes during this period, No. 1 Canadian Stationary Hospital, which had been working in Boulogne for a few weeks, left for the Salonica front in July, while in September No. 2 Stationary (Canadian), previously at work at Le Touquet, replaced No. 2 Stationary (British), which left for Abbeville.

There likewise arrived from St. Nazaire at the beginning of this phase No. 8 Stationary Hospital, which at once became an exception to all hospitals so far established at this base. All these depended for their accommodation mainly on pre-existing permanent buildings, but as nothing of this kind was available for No. 8, it was given as a site some fields on the edge of the cliff, just outside the village of Wimereux. Here it erected its tents, but within a short time began to replace them rapidly by wooden huts. Nevertheless, although a camp hospital, it managed to render itself independent of ordinary camp sanitary arrangements. This it did by taking advantage of its position on the cliff overhanging the sea, and providing itself with a complete water carriage system in the shape of ordinary water closets connected with a septic tank which discharged at high water into the sea. Curiously enough, the local civil authorities objected strongly to this arrangement until it was pointed out to them that it was vastly superior to that of Wimereux itself. Here most of the houses likewise discharged their sewage into the sea, but did so without first submitting it to any treatment such as at No. 8 Stationary Hospital rendered it both odourless and innocuous.

A further occurrence of importance before the end of the first six months of this phase was that in September. No. 13 Stationary Hospital, after putting up a very hard fight, at length succumbed to fate and ended its existence as the Sugar Store Hospital.[1]

It was an event which on several grounds was very much regretted, but it could not be avoided. Early in the spring the army postal authorities had been given a footing on its premises behind the landing-stage station, and as time went on their demand for space increased.

[1] Its first C.O. was Major H. L. W. Norrington; he was succeeded in the spring of 1915 by Major S. G. Butler, and the latter by Major Sidgwick.

Simultaneously there was strong pressure in a corresponding direction from the local civil authorities. They claimed, not unjustly, that to regain the use of the main portion of the store was essential to the commercial interest of the town.

It was hoped for some time to be able to avoid moving this hospital to any considerable distance from its site close to the train unloading point. The first proposal was to build huts for it in the Place Capécure, where it would have been close to the unloading point of the hospital trains, though not to the hospital ship embarkation point. A second one was to place it in the building belonging to the Chamber of Commerce adjacent to the grounds of the Casino. Neither plan, however, proved possible, so eventually a hutted camp was arranged for it on the ground alongside the road leading to Wimereux, about a mile beyond the Casino. Here it was still available to some extent as an emergency hospital, and at any rate had plenty of room for expansion.

Also well within the first half of the period were two other occurrences, one of interest and the other of importance. The first was the arrival of No. 22 General Hospital, whose peculiarity lay in the fact that its staff, with the exception of its commanding officer, was entirely supplied by an American University. After working for a time elsewhere, it took up its quarters at Wimereux, but moved to the Etaples area after two or three months.

The other event was the destruction by fire of the hotel premises of No. 14 Stationary Hospital on January 22nd, 1916. Though the fire began on the top floor, which was mainly used for laboratory purposes, it proved, owing to lack of water, impossible to do anything more than keep it under just long enough to get the wards clear of patients, and eventually the building was entirely gutted.

Fortunately there was no loss of life, but many of the laboratory records were lost. These were of value, as this unit had made an elaborate and original study of the distinctive points of the different classes of typhoid fever.

One result of this fire was to bring up the number of hospital camps to three; a short time previously the unit just mentioned had arranged an emergency annexe on some ground opposite to No. 14 General Hospital, and this nucleus it rapidly developed into a complete hospital by the erection of huts. Meantime, by the use of tents and of the original bathing box annexe, the isolation work was duly continued.

Three other events during the second six months of this phase were the arrival of an Australian unit and of two Canadian units. The Australian unit, No. 2 Australian General Hospital, had previously been at work in Egypt, and on its arrival in Boulogne, in July, 1916, was given a camp site outside the village of Wimereux alongside the new No. 14 Stationary Hospital. The same ground had previously been used for a short time by No. 5 Convalescent Depôt. One of the two Canadian units mentioned, No. 3 Canadian Stationary, had also come from the Mediterranean (Mudros). It remained in Boulogne only a few months, moving up to Doullens at the end of the Somme offensive.

The other unit, No. 3 Canadian General, was at work in the Etaples area till the end of January, 1916, and then moved up to Boulogne, where it was given the Jesuits' College.

This site had by now totally lost the depressing appearance it possessed when the Meerut Stationary Hospital took it over in 1914. That unit during its tenure—which lasted to the middle of December, 1915—had been very industrious in cleaning up the large grounds attached to the college. In addition, the half-falling walls, that resulted from the fire which destroyed the main building a few years previously to the war, had been pulled down and the stones removed. A good many huts had also been erected. To these the Canadian unit began to add, and thus found plenty of room to extend to a degree corresponding to the strength of its personnel. This, as in the case of the other two Candian units, was much greater than that of British units of the same nominal size.

As, about the middle of the phase, No. 25 General Hospital had taken up its quarters in the hotel at Hardelot used earlier by the Secunderabad Indian unit, while No. 11 General, owing to its premises at the Imperial Hotel having developed serious structural defects, had moved to the Etaples area, the net effect of the various changes mentioned was that by the middle of the year 1916 there were twelve large and small hospitals in the Boulogne area; four were in camps, and the rest were more or less entirely in permanent buildings.

Of the whole number, one group of three was in Boulogne itself and therefore sufficiently near the train unloading point to take cases not fit to be moved far by road, another group of six was at Wimereux between three and five miles from the port, but along a level road, while the remaining three were all isolated and two of them not very accessible.

Judged by the names of the units the total bed accommodation of the base was very much what it had been in 1914. Practically, however, the difference was very material, for by this time all attempts to maintain any distinction between "Stationary Hospitals" and "General Hospitals" had been abandoned, and each unit was encouraged to expand to as large an extent as the nature of its site permitted. Superficially the increased number of beds seemed superfluous, for, despite the occurrence of the Battle of Loos in the autumn of 1915, the daily average of sick and wounded reaching Boulogne during the first six months of this third phase was a good deal less than a third of the number that daily reached the base during the First Battle of Ypres; indeed, it was only a little more than a third even in the second six months, though the fighting in the Ypres salient was still very active, and the British front had been extended southwards by upwards of thirty miles.

The circumstances were, however, somewhat different. In the early days all the hospitals were practically acting as casualty clearing stations, and for the most part sending their cases over to England as soon as they were esteemed fit to travel; but by the middle of 1916 they were, and had been for about a year past, endeavouring to act as base hospitals, and therefore retain their cases habitually unless

definitely ordered to empty as many beds as possible. Such orders were not infrequently received, and used to give rise to a good deal of wrath among the medical staff, as often nothing to explain their issue happened, and meantime the medical officers had lost the cases they were studying.

However, the authorities knew what they were about, for on July 1st the Battle of the Somme commenced, and the number of cases reaching Boulogne immediately jumped up so high that the daily average for the whole succeeding six months was nearly twice as great as during the preceding twelve.

Another feature during this phase was some accentuation of the already obvious tendency towards specialization. No. 8 Stationary Hospital, for instance, became the recognized place to which to send cases of gunshot wounds of the thigh, and No. 13 General specialized to some extent in the treatment of factures of the skull. At No. 13 Stationary wards were set aside for treatment of injuries of the eye and jaw respectively, specialists in these lines of work being appointed to take charge of them.

Apart from the treatment of wounds, the purely medical side of the work was also developing. At No. 3 Canadian General arrangements were made for the treatment of patients suffering from ordinary throat and ear troubles, and at all hospitals maladies such as trench nephritis, trench fever, were being differentiated and studied as war-time entities.

A third feature during this phase was the commencement of the use of the hospitals at this base, especially those lying relatively near the port, as places for the temporary reception of patients arriving from Etaples and elsewhere for embarkation to England. Whenever possible, these cases were loaded straight on to the hospital ships, but frequently, owing to bad weather, submarines, and other causes, there was inevitable delay, so Boulogne began to become accustomed to have to receive suddenly for the night or longer some hundreds of cases which did not count officially as admissions.

The general medical work had also grown during this phase, as there were increases in the number of camps established within the Boulogne area either for the housing of labour parties or for the temporary accommodation of reinforcements, or for men going on leave. As a result the sanitary work of the base had increased likewise, and the arrangements for the medical treatment of men in billets, barracks, etc., had had to be further organized. Among other things a station for the inspection of new drafts was established at the old headquarters of the base in the Bassin Loubet, and surgeries at three of the camps were arranged within the first six months of the phase. In the last six months there were added to two of these surgeries or inspection huts, places in which patients could be kept under medical observation for a few days, if desired, without being formally admitted to hospital.

The last occurrence of this third phase was one which, apart from the military danger that it represented, threatened to spell the end of the medical work of Boulogne as so far conducted.

Just after Christmas Day a grain steamer went ashore just outside the port. It was got off by tugs, but these, instead of contenting themselves with taking it inside the breakwater, endeavoured to take it into the port itself. The after tow line broke, and the salvaged vessel swung across the very narrow channel between the piers, grinding its stern against one of them. The tide then went down, and the vessel, swinging right across the fairway, broke its back and blocked the port of Boulogne absolutely.

After six weeks' work it was found possible to refloat the vessel in two halves, but meantime the effect on Boulogne had been great. It was instantly deprived of its daily supply of ships, there was some danger of the port silting up—the dredgers being unable to work—and the port was useless for evacuation purposes. Consequently the hospitals used to send their patients for shipment either down to Havre, which was a very long way off, or to Calais. The latter was the course habitually adopted, though Calais harbour did not lend itself well to hospital ship work on a large scale.

The Fourth Phase.

The first few weeks of the fourth phase, which began in the winter of 1917, and ended about Christmas of the same year, were very quiet owing to the accident just recorded; in the circumstances it was desired to use Boulogne hospitals as little as possible. Fortunately, however, the base was quite ready for work by the time that the first heavy fighting of the year took place. This was the Battle of Vimy, early in March, and as it was followed in May by the Battle of Messines, by the Nieuport offensive in June, and then at the beginning of August by the very prolonged Third Battle of Ypres, to all of which localities Boulogne was much nearer than any other base, it was kept busy right through the phase.

Meantime its bed accommodation had been considerably increased, four Territorial General Hospitals which had come to France in April being assigned to Boulogne. Their dispatch was induced partly perhaps by the expectation of a heavy summer's fighting, but also no doubt by the possibility of the transfer of patients to England being difficult. Apart from accidents such as that at Boulogne, the "U"-boats were attacking hospital ships whenever possible. The latter had always been readily distinguishable at any distance, both by night and by day, from all other ships, but as this fact afforded no protection they were, during this phase, converted into ordinary ships, and began, like the mail boats and troopships, to make their crossings under the protection of destroyers and dirigibles.

The Territorial Hospitals mentioned arrived long before they were expected, and great difficulty was experienced in finding a suitable location for them. Finally sites for two—No. 54 and No. 55—were arranged alongside the Australian Voluntary Hospital, which had now become No. 32 Stationary Hospital; while the third—No. 53—was placed also outside the village of Wimereux, but on its eastern side. The fourth, No. 57, opened up on Marlboro' Downs, but after a few months was sent to Marseilles.

A material part of the difficulty of finding sites for these new hospitals was the question of water supply, which had long been troublesome.[1] Lighting had never been a difficulty as, though the gas supply of the town was very indifferent, the electric supply of the town was good, and the outlying hospitals could also provide for themselves as much of the latter as they pleased by dynamos. They wanted a great deal, as the X-ray work done at all of these was considerable.

Two other hospitals were added to the area during the phase, but did not increase its troubles in the matter of water; for one—this being for Portuguese troops—was placed at Ambleteuse, and the other at a spot some five miles south of the town in the locality known as Pont-des-Bricques. This latter hospital was originally built for the Cape Boy Labour Group, and on the departure of most of these became the Chinese or Native Labour Hospital.

All these new hospitals were eventually placed in huts, but for a time the Territorial units were under canvas and had some unhappy experiences. The sand underlying the soil in much of the Wimereux area was bad holding ground for tent-pegs, and they had difficulty in keeping their marquees steady.

The difficulties in regard to the sites led to considerable delay in the opening of the new hospitals, but this was no real disadvantage. War wounds and diseases as seen at early and late stages present very different problems, and the experience of the staffs of these new hospitals had been limited to work in the United Kingdom. They had therefore a very great deal to learn on their arrival, and for this purpose they were distributed among the already existing hospitals pending the creation of their own.

Something approximating to this course had also to be arranged in respect of a batch of surgeons from Dublin who arrived about the same time. The hospital at which they were to work was ready, but in view of their inexperience they first worked as understudies of the men already there. This hospital was No. 13 Stationary, which on the arrival of this group changed its name to No. 83 (Dublin) General Hospital. A unit which had worked in Boulogne from the beginning, and had made a great reputation for itself, thus disappeared. However, its disappearance was to some extent merely nominal, as the C.O.[2] of No. 13 remained on in command of the new unit, and the ophthalmic and jaw surgery departments, which had reinforced the reputation built up by No. 13 as the Sugar Store Hospital, continued their work under their original officers.

The Dublin group also had nothing to do with an important electric therapeutic annexe, which had already been planned and came

[1] As already stated, the original water supply was equal only to about eight gallons per head of the normal population, and though the civil population had been depleted by the mobilization of many men, it was kept quite up to its original size by the presence of refugees, and the total population had been increased by thousands owing to the presence of British troops. Also the water demands of the hospitals were great, much greater than those of ordinary dwellings.

[2] *Vide* note 1, p. 393.

into actual existence as a gift from the British Red Cross Society in the course of the summer.

The word "Dublin" was introduced into the title of the unit because the group of surgeons in question had come out under an agreement made by Sir Alfred Keogh, the head of the Medical Department of the War Office, with the Royal Colleges in Dublin. They undertook to supply from the staffs of the Dublin civil hospitals a group of medical men who were ready to work in a base hospital in France for a period of three months, then returning home and being replaced by another group. During their period of service the surgeons forming these groups were to be given rank as officers of the Royal Army Medical Corps, and there were to be distributed among them as many majorities and lieutenant-colonelcies as General Hospitals were entitled to possess under the war establishment regulations drawn up long before the war.

The arrangement in respect of the Territorial Hospitals—also made by Sir Alfred Keogh—was almost identical, except for the fact that the contracting party, so to speak, was a Territorial unit in the United Kingdom, which in each case undertook to supply the groups required for the work in France from the *à la suite* but unemployed members of its own staff.

Independently of hospital work, there were other circumstances which began to increase the work of the base before the first six months of this phase were complete. Among these was the arrival of the W.A.A.C.s, or "Brownies," as the women belonging to this corps were called; a great increase in the size of the many Labour groups stationed in the town; and a decision to make Boulogne one of the principal centres for the periodical examination and regrading of all men serving at the base in any capacity.

The W.A.A.C.s began to arrive towards the end of March, and before long numbered many hundreds. As a rule they were remarkably healthy young women, but since in the selection of the earlier groups the question of their dental condition had been somewhat overlooked, a good deal of work was at first thrown on the dental department at Boulogne. Though they brought with them some women doctors, their arrival necessitated the addition of some wards to the sick bay for Nursing Sisters at the Château Mauricien. Here they were under the general supervision of the medical officer of this annexe of No. 14 General Hospital, but they received their treatment as a rule under their own women doctors. The latter also held daily sick parades at the various residential hostels of the corps, and one of them acted as sanitary officer in respect of all offices where its members were employed.

The extension of the number of Labour groups using Boulogne as a centre of their work necessitated a corresponding extension of the existing camp on Henriville Bluff, as also the creation of a new detention hospital thereat. The original occupants of this camp were Egyptians, but after a few months the Egyptian Labour Corps was replaced by the Chinese. Among both these Labour groups there was at first a considerable amount of trachoma, but thanks to the steps

taken to deal with this highly infectious disease of the eyelids, it was soon reduced and kept down to quite insignificant proportions.

The augmented regrading work was grouped round the already existing arrangements for this purpose, these again being, and having been from the beginning, intimately connected with the general arrangements for the supervision of the health of the occupants of all camps and barracks.

Early in the second half of the phase was achieved the first effective step towards a complete alteration of the arrangements for dealing with convoys of sick and wounded. These were still much what they had been at the end of the second phase. The St. John Ambulance loading and unloading party had been replaced by a stretcher-bearer company from base details, but train unloading arrangements still took place at the Central Station.

The ideal arrangement was that which had prevailed as long as the trains could be run out on to the landing wharf, thus making the unloading point of the trains and the loading point of the ships one and the same place, while within a few yards there was a hospital in which specially severe cases could be housed forthwith. When, for the reason already described, this ceased to be possible, unloading at the Central Station was a fairly good alternative, as there were plenty of beds not far off.

Later on, when the bed accommodation of the Boulogne group of hospitals began to grow small as compared with the total accommodation of the area, the position became less satisfactory. However careful a driver may be, carriage in an ambulance car inevitably throws a certain amount of strain on the patients, so it is desirable to keep as short as possible the journeys between the train unloading points and the hospitals, and between hospitals and ship embarkation points. Apart, too, from the professional point of view, the greater the distance to be travelled, the greater is the expenditure of labour, etc., in handling a convoy.

It was impossible to bring the hospitals any nearer the Central Station or port, but, in theory at any rate, it was not impossible to bring the train unloading point nearer the majority of the hospitals, so for a long time the D.D.M.S., Boulogne, had been endeavouring to arrange a second unloading point at Wimereux. The medical advantages of such a step became all the more obvious when the Wimereux group was augmented by the arrival of the new Territorial Hospitals, and in August the French authorities at length agreed to allow a hospital train siding to be arranged close to Wimereux Station.

Another occurrence of some interest at this phase was the erection in the grounds of No. 14 Stationary Hospital of a "Consultant's Hut" by the British Red Cross Society. The original idea was to provide a place at which certain of the consultants could keep constantly under their own treatment cases in whose study they were specially interested; it was not, however, seriously required for this purpose, and the greater part was soon converted into a medical reading room and library. It also began to serve as the headquarters of the Boulogne Medical Society, a body of which all medical officers stationed

at Boulogne were *ipso facto* members, and which grew out of the meetings formerly organized at the Australian Voluntary Hospital.

A little later on visits from enemy aircraft, of which Boulogne had already had some experience, began to be somewhat troublesome. It was not until quite at the end of this phase that they became of any importance, but even at this time the anti-aircraft firing disturbed the patients sufficiently to suggest a doubt as to whether it was desirable to retain for treatment in Boulogne entirely helpless cases, such as those of fracture of the femur, any longer than was inevitable.

At the beginning of winter Boulogne was called upon to furnish the chief medical unit for the Italian Expeditionary Force, and thus lost most members of the existing staff of No. 13 General Hospital. These were replaced in the middle of November by a group of American medical officers who had been serving in the Etaples area. Finally, just before the end of the phase, No. 7 Stationary Hospital gave up the premises it had so long inhabited and opened up a large hospital camp on the downs about half a mile from the Jesuits' College. It was replaced by a Red Cross unit from Etaples, the Baltic, and Corn Exchange Hospital.

From beginning to end the phase had been full of interest, but psychologically it was for two reasons not a period of entire healthiness.

With few exceptions the medical officers of Boulogne had been private practitioners before the war, and many of them had given up their practices and enrolled for service in the field at its very commencement. Hence a serious degree of irritation was created among them by the circumstances attending the arrival of the Territorial and Dublin staffs. It was thought that, as their members had already enjoyed a very great advantage by being able to remain in their own homes and continue to carry on their private practices for nearly three years, it was unfair that when at length they came abroad they should be accorded the further privileges already mentioned, namely, the ability to return home after a very short term of service, coupled with freedom from any liability to be employed elsewhere than at a base.

To many a still greater source of irritation was the superior rank given to the newcomers. Hitherto none of the Boulogne hospitals had been staffed on a war establishment basis; almost invariably the only officer above the rank of a captain had been the officer in command, and the home authorities had steadily refused permission to the D.G.M.S. to make any promotions to major. Furthermore, dislike of the arrangement was not confined to medical officers more directly affected and irritated thereby. Apart from there being a good deal of sympathy with these on general grounds, it was clear to all that the periodical arrival of new groups of officers to take up highly responsible positions, though quite inexperienced in the particular sort of work required, would make it more difficult to keep the professional work of the base up to the high standard which had been reached.[1]

[1] It should be mentioned here, perhaps, that later on this particular disadvantage was partly neutralized. The arrangement with Dublin ceased at the end of twelve months, while a considerable number of the members of the staffs of the Territorial Hospitals elected to remain on permanently.

Another cause of psychological unrest—one not originating in this phase but accentuated therein—was of an entirely different kind. The value of team work for the performance of operations had been recognized in the casualty clearing station area within the first year or so of the war, and the consultants and senior officers of Boulogne hospitals were anxious to get the same kind of principle applied there likewise. Only when the staffs of hospitals were formed of men accustomed to working together, and when the more important positions were filled by officers specially trained to the work assigned to them, could best results be surely attained. Obviously, however, stability was essential to such a condition, and, unfortunately, stability was of all things the most difficult to secure.

The prevailing influence, in fact, was uncertainty, alike as to the amount of work that would have to be performed, and as to the number of men who would be available for its performance. It was due to several factors:—

(*a*) Owing to difficulties raised by civil medical authorities in the United Kingdom, the War Office at home could not send out more medical reinforcements to France than from time to time were shown to be absolutely essential, and it could never arrange for their dispatch at regular intervals.

(*b*) A majority of the medical officers in France were serving under individual yearly contracts, and there was never any certainty as to how many of them would agree to renew these contracts.

(*c*) From month to month the amount of wastage among medical officers by wounds and sickness could never be foretold.

The latter factor began to tell heavily after about the middle of 1916, with the result that Boulogne was called upon to send up medical officers to replace casualties in the armies with increasing frequency, and as this often meant parting with some of the best of its younger men, Boulogne became very aggrieved thereat.

On the other hand, Boulogne on paper was better able to meet the demand for reinforcements than any other base, for, practically speaking, all medical reinforcements for France landed at Boulogne. Here, unless special orders concerning any individual had been received, they were distributed among the hospitals, partly to occupy them till they were required elsewhere, partly in order that something might be learnt of their abilities. Consequently the Boulogne hospitals were often quite fully staffed from a paper point of view, though very much otherwise from that of those directly responsible for the character of the work. Furthermore, the reinforcements from home often arrived at moments of pressure, and this made the medical officers already at work resent having to take part in teaching new-comers.

Everyone who had studied the circumstances knew that this instability was, practically speaking, unavoidable, but Boulogne medical officers would hardly have been British if such trifling circumstances as this had altogether prevented them from "grousing." Luckily there was very little time for "grousing," either overt or suppressed, for throughout the whole of this phase there were very few weeks during which the medical staffs of the Boulogne hospitals were not

thoroughly occupied by their work; the daily number of casualties reaching the base throughout the whole of this phase was high.

Furthermore, when, at the end of this phase, Boulogne was able to look back upon forty months of work, there were many points which it could regard with satisfaction:—

1. In 1914, when it was suddenly called upon to act as a huge casualty clearing station, it had successfully grappled with the task, though much of its machinery was hardly yet planned, and none of it completed; and it had equally risen to the occasion when—

2. During many subsequent battles the amount of work thrown upon it had been such as severely to test its arrangements, which, though much more ample than before, were still not as perfect as it could wish.

3. First and last it had admitted to its hospitals over half a million wounded and sick men, and some tens of thousands of these it had subsequently prepared for a return to their units by means of its four convalescent camps.

4. The majority of all patients sent to England had been evacuated through its port; and, independently of hospital work, it had attended to the needs not only of the many thousands of men stationed within its confines, but also to those men who, to the number of thousands, daily arrived on their way to or from Great Britain.

5. Its hospitals had acted as the first training ground for a large proportion of all B.E.F. medical officers, and within them, too, most of the consultants in France had gained their first knowledge of the problems with which they were to deal elsewhere.

6. In the solution of these new problems, so far as they had been solved at all, viz., the psychology of war wounds, the best treatment of fractures of the thigh and skull, of traumatic pleurisy and trench foot, of the differential diagnosis of fevers of the typhoid group, of the nature of trench fever and campaign nephritis, and the early and late treatment of "gassing"—it had played a prominent and useful part. It had done so in a measure by its direct efforts, in a further measure by serving as a meeting ground for surgical and medical officers, both senior and junior, working in the areas of the armies and elsewhere.

7. In the latter respect the proximity of Boulogne to the armies and to the United Kingdom had given it advantages, and these it had been able to heighten by being the headquarters of the B.E.F. branch of the Medical Research Committee, part of whose work it was to act as a receiving and distributing focus of information upon all professional subjects. Furthermore, it was not alone workers in France that Boulogne had been able to instruct. Many dozens of scientific men from the United Kingdom and elsewhere had made in its hospitals their first acquaintance with the early stages of war wounds and diseases.

Boulogne had, in truth, plenty of reasons for feeling pleased with itself, though, as indicated in the opening paragraphs of these notes, it was to learn in the next phase of its existence that there were still ways in which its work could be improved.

The Fifth and Final Phase.

The first event of the fifth phase, or the last of the fourth, was the vacation by Surgeon-General Sawyer of his position as D.D.M.S. of the base, under recent Army Council orders that officers who had reached the age limit of their rank must return to England. He was succeeded by Colonel H. S. Thurston, who soon after his arrival fell in with a proposal to the effect that all the principal departments should give up their existing quarters and group themselves together in one large building likely soon to be available for such purpose.

As this building was in the main street leading from the upper to the lower town, the arrangement somewhat decentralized medical headquarters topographically from the point of view of the hospitals. On the other hand, it tended to increase their telephone facilities, and, apart from putting the D.D.M.S. in more direct touch with other base chiefs, enabled him to provide offices in connection with his own, not only for the sanitary expert and the officer in charge of re-grading work, but also for the principal matron of the Boulogne base and the senior of the medical officers in immediate charge of Queen Mary's Auxiliary Army Corps. These officers, though women, were employed and paid as members of the Royal Army Medical Corps.

A further occurrence was an important addition to the arrangements at Wimereux. It consisted in the provision of a second hospital-train siding at Terlincthun, about 1,000 yards distant from Wimereux. The completion of this, early in April, enabled the Central Station to be abandoned altogether as an unloading point for hospital trains from the front: and thereafter it was used only for trains bringing patients from bases to Boulogne with a view to their embarkation to England forthwith. This change necessitated some addition to the staff of the Embarkation Medical Officer, as he now had to keep going two offices, one on the landing stage and one at Wimereux, but in itself represented progress. At Wimereux the unloading point was conveniently placed for all the grouped hospitals, while, by improving an old road across the downs from Wimereux to the neighbourhood of the Jesuits' College, No. 3 Canadian General, as also No. 7 Stationary at its new site, was brought quite as close to the new unloading point as it had originally been to the Central Station.

In the same month the heaviness of the fighting in progress, or rather, the extent to which mustard gas was being used by the enemy, led to the creation of temporary accommodation under canvas for about 700 cases of gassing. The marquees required were distributed among the camp-site hospitals which had the necessary space to spare.

There also arrived about April No. 7 General Hospital: it had previously been at work at Mallasisses, near St. Omer, but after the German offensive in March, found itself too near the front. Hence a camp site was arranged for it on the downs alongside the road from Wimereux to the Jesuits' College.

With one important exception, and apart from the improvements, additions, and modifications of structure such as are always in progress

in army medical hospitals, whether their sites be camps or permanent buildings, these were all the objective events of this phase. The important exception was that, towards the middle of the year, arrangements had to be made for protecting the inmates of hospitals and their staffs from the effects of air raids. This was done by building round all huts or tents used as wards, walls of sandbags sufficiently high to protect a patient lying in bed from the effect of any bomb bursting outside them.

Roofs so thin as to make it possible for portions of anti-aircraft shell to fall through them while still possessing any momentum were also strengthened, and outside the huts or other wards were provided narrow trenches or dug-outs in which patients able to move could take cover.

In the case of hospitals mainly dependent on permanent buildings for wards, very little could be done to provide protection on the same lines, and in no case, of course, could protection be provided against direct hits.

During the summer months there were from twenty-five to thirty attacks on the area of greater or less severity: and in addition there were very frequent alerts, for when the crossing of the line by bombing squadrons was signalled from the front, Boulogne had to stand to until it was certain that the objective was some other coastal town than itself. In the event the actual damage done to the hospitals was slight. There were some losses amongst the personnel and a few huts were destroyed, but no patients were wounded or killed. The general effect on the patients, however, was bad: broken rest due to the alerts and the noise of anti-aircraft guns were quite sufficient by themselves to retard a patient's recovery. The effect would have been worse had not the larger number of hospitals lain at some little distance from the centre of attack. Not always, however, was this the case; on two occasions the enemy aircraft included Wimereux in their visits, and on each of these the hospitals of that group sustained damage.

A by-product of these aircraft attacks was a further change of site on the part of the D.D.M.S. office. In the middle of the summer the building used as the general headquarters of the base was destroyed by a fire resulting from a bombing attack, and the D.D.M.S., after a few weeks' stay elsewhere, established the fifth medical headquarters of the base just under the walls of the high town. Many of the departments in the destroyed building lost most of their records, but the more important of those belonging to the medical department, as well as typewriters and other portable articles of value, were rescued by members of the staff of the D.D.M.S. office on duty at the time.[1]

The provision of extra bed accommodation for gas cases that has been mentioned was part of a new attack by the D.D.M.S. on the general problem of evacuation, the latter being the resultant of quite a number of opposing lines of force. In other words, the essence of the problem is how to meet simultaneously at least three distinct

[1] These included the D.A.D.M.S., Major Dickson Stirling, D.S.O., and Captain H. D. F. Brand.

and almost antagonistic needs: a military need, a medical need, and a man-power need.

The military need is that there should be ready in advance as many hospital beds as are likely to be required as the result of any given military operation in view. The medical need is that no beds shall ever be vacated if its existing occupant is likely to suffer from transference elsewhere: while the man-power need is that the time for which a soldier is absent from his duties as the result of either wounds or sickness shall be kept to the lowest possible number of days.

Boulogne had tried many different ways of meeting these three needs in the course of its existence, and by the beginning of the fifth phase the position in respect to the first two was fairly satisfactory. The medical need was met by setting aside a certain number of beds known as "special beds," which were not to be vacated except on purely medical grounds. The military needs were met by the hospitals holding themselves ready on demand to empty the whole of their beds, other than special beds, at a few hours' notice, and also by undertaking to improvise in addition a certain number of "crisis" beds if absolutely required. The third need was less well met. The occupants of the ordinary beds, when it became necessary to empty them, often included a high proportion of cases whose need of hospital treatment was not likely to be prolonged. Evacuation of these cases met the military need, and medically it was unobjectionable, but it was fatal to the claim of the man-power need; as the return of the men to their duties was certain to be retarded by their transfer to the United Kingdom.

The plan finally adopted by the D.D.M.S. was one which had been envisaged by his predecessor but never completely realized, i.e., the imposition of rules which would effectively stimulate the hospitals (1) to refrain from keeping themselves crowded with cases which clearly could not return to duty for many months, but were fit for transfer to the United Kingdom either forthwith or after the performance of an operation; (2) never to keep a case for treatment solely on account of its interest; and (3) always to bear in mind the great undesirability of evacuating to England any case whose complete recovery might be expected within a short time.

It was no use, however, preaching the latter doctrine unless a means were provided for emptying a bed of a light case, and yet not sending that case to England. Consequently the D.D.M.S. doubled the accommodation of the two convalescent depôts established in the previous phase and entirely specialized the function of the earlier two. In other words, the two former were so enlarged as to be capable of meeting every possible call, and the two latter exclusively reserved for the work assigned to them, namely, the treatment of men who had recovered from the first effects of conditions, such as mustard gas poisoning, trench fever, and dysentery, or who were the subjects of only very slight wounds.

There was also progress in another direction. Though Boulogne continued to be the landing port for medical reinforcements, these,

after June, began to be sent on arrival to a species of school or training depôt elsewhere, so that Boulogne hospitals were less disturbed than previously by the continual coming and going of new men.

On the other hand, the general work of the hospitals began to be greatly handicapped by the continued demand for subordinate personnel for the front. The number of trained R.A.M.C. orderlies had been growing less for a long time past, and in this phase they almost vanished. It was a circumstance which greatly increased the amount of work thrown on the nursing department, as also the responsibilities of the quartermaster and remaining N.C.O.s.

However, this fact did not suffice to mar the success of the fifth phase, which up to the date of writing has been marked. Especially is this true in respect of the attempt mentioned to reduce the proportion of quickly-recoverable cases among the evacuated. The current figure is much below that of other bases, as also below Boulogne's own figure for earlier phases.

In the remaining time for which Boulogne is used for a medical base the arrangements are not likely to undergo any material alteration; so some general results of its past four years' working may, perhaps, usefully be noted.

(1) The proximity of Boulogne to the front, and its situation in regard to the United Kingdom, created from the beginning a tendency to use it very much as if it were merely a magnified casualty clearing station centre. It has succeeded in resisting this influence in respect of not less than 50 per cent. of all the cases reaching it. In respect of these it has acted as a true medical base by keeping them until further hospital treatment has been no longer required. Such cases have not been merely slight cases, but have included fractures of the femur, gunshot wounds of the face and jaw.

(2) Partly for administrative reasons, partly because relatively few cases in this war represent only one type of injury, it has never been able completely to specialize the function of any one hospital.

Nevertheless it has managed to secure much of the value of specialism by maintaining special beds in various of its units. Thanks to this fact it has been able to lead the way in the treatment more particularly of typhoid fever, of fractures of the lower extremity, and of wounds of the face and eyes. It has also, by means of its convalescent depôts, shown that most of the heart troubles occurring after fever of one sort or another, as also most cases of mustard gas poisoning, can be successfully treated in units belonging to an expeditionary force.

(3) Progress in the science of pathology is essential to all sound progress in treatment, and the four years have shown how much in this direction may be achieved by the medical department of an army in the field, e.g., the work done by officers stationed in Boulogne has cleared up the pathology of chest wounds, especially those complicated by infection of the pleura, and it was work done in its laboratories that first showed why good results could not be expected from the methods of wound treatment initially adopted in the war.

(4) It has, though much against its will, fully demonstrated the fact that units much larger than those anticipated by war establishment regulations can be successfully conducted by much smaller and less elaborate staffs than those assigned to general hospitals under the regulations in question. During the greater part of the four concluded years, most of the Boulogne hospitals have had much less than one medical officer for every fifty beds, and only one officer of field rank instead of the half dozen allotted to general hospitals by war establishment regulations.

(5) Its hygiene laboratory for some time did all the chemical analysis work required by the Expeditionary Force, and it has since had referred to it for solution so many problems arising elsewhere as to prove that a base hygiene laboratory is not rendered superfluous by the more modern "Mobile Hygiene Laboratory."

(6) At one time it looked as if the experience of this base might definitely settle the question of the relative value of permanent buildings, tents, and huts from the point of view of hospital work. This, however, can hardly be said to be the case; the turnover of patients has been too rapid to supply any incontrovertible evidence on the question from a medical point of view, and from an economic point of view the constant rise in the price of camp building materials of all kinds has rendered accurate comparative estimates of expenditure impossible.

For somewhat corresponding reasons Boulogne's experience does not throw much light on the question of what is the best arrangement of a camp hospital. The various units have had to dispose themselves according to the character of the site available, and the style of the huts used has had to depend mainly on the material that could most easily be secured at the time of their erection.

One thing, however, the Boulogne hospitals have certainly proved, namely, that the very best kind of medical and surgical work can be carried on in buildings whose initial and maintenance cost is very much less than has hitherto been considered reasonable in respect of hospitals for civil populations.

Postscript.

A week or two after the foregoing paragraph was written news came of the signing of the armistice. At first this event made practically no difference to the work of the base, but shortly afterwards Boulogne began to prepare to act as the chief demobilization port. Such duty necessitated the immediate setting aside of some of its medical units for the accommodation of men on their way home and their medical examination before embarkation.

At the date of the armistice the medical units of this base had on their hands some 29,000 cases, out of a total accommodation (normal and crisis) for approximately 40,000. (This figure does not include the beds of the hospitals in the Portuguese sub-area. The

latter were staffed by Portuguese officers, but members of the British Nursing Service were in control of their nursing arrangements.)

The patients then on charge at Boulogne included a considerable number of Americans, a few French, Russian, and Italian soldiers, a few civilians, some 200 Chinese and other men belonging to coloured labour groups, and a considerable number of German prisoners. As many cases remained to be sent down from the casualty clearing stations, and there were a good many local admissions owing to influenza, etc., the work of Boulogne did not materially diminish for some time Eventually, however, it proved possible to close most of the units after their preliminary reduction to a skeleton establishment, and only those now remain which are considered likely to be required for a somewhat indefinite period. Meanwhile the area of the base has been greatly enlarged, and Boulogne itself has been made the headquarters of the General Officer in Command of all troops in France and Flanders.

NOTE.—In Note 3, on p. 277 (May JOURNAL), the name, Lieutenant Redwood, should read Lieutenant J. H. Redstone. It should have been made clear that Sir Percy Woodhouse, D.M.S. of the original Expeditionary Force, became D.M.S. Lines of Communication in January, 1915. Surgeon-General R. Porter was D.M.S. of the army holding the Ypres front from late 1914 onwards, and Sir George Makins was the senior of the original band of civilians appointed consultants to the armies in France.

SOME SIDE LIGHTS ON THE CAMEROON EXPEDITION:

BEING EXTRACTS FROM THE DIARY OF

The late MAJOR WALTER MEYER-GRIFFITH, T.F., Croix de Guerre, F.R.G.S., F.R.Hist.S., F.S.A. (Scot.).

THE outbreak of the Great War found Major Griffith at Sierra Leone, holding the appointment of A.D.C. and Private Secretary to H.E. Sir Edward Merewether, K.C.V.O., C.M.G., Governor and Commander-in-Chief of Sierra Leone. He had previously served through the Boer War with the South Wales Borderers in the rank of Lieutenant, and later was in the Special Reserve, Loyal North Lancashire Regiment.

Major Meyer-Griffith, in 1910, was a Captain in the Reserve of Officers, and Troop Leader, North Kent Squadron, Legion of Frontiersmen. In September, 1910, he took up the post of O.C., Officers' Training Corps, Glenalmond (Highlanders), with the rank of Major on the unattached list, T.F. In 1912, he requalified as French Army Interpreter. In 1913, he resigned his appointment as O.C., Officers' Training Corps, Glenalmond, having been offered the post of A.D.C. and Secretary to the Governor of Sierra Leone. Leaving England in February 1914, and arriving on February 24th, he soon settled down to the duties of his new appointment, and found an outlet for his super-abundant energies in re-starting the Boy Scout Movement.[1]

The diary shows how much Major Griffith chafed at the idea of being " out of it," and his impatience at the " local " purview taken by many officials and civilians—especially when it was decided to send some of the available troops away from the Colony.

However, on August 29th, 1914, a wire from the Secretary of State gave the information that General Dobell was coming out to take over the command of the Cameroon Expedition, and would require a French interpreter for the Staff of the French Commander. This was an appointment for which Major Griffith was well qualified, and he wrote to the Governor asking to be allowed to quit his appointment.

His resignation was accepted by H.E. the Governor.

DIARY.

Saturday, September 12th, 1914.—Became a member of the British Expeditionary Force to the Cameroon.

[1] He had applied to W.O. for employment at the front in France, and was to have sailed for England on the 14th inst. for that purpose.

It happened in this way. General Dobell (and Staff), commanding the Anglo-French Expedition, arrived at daybreak, and the General having received a wire from Sir Frederick Lugard in a cypher which he had not got, sent the wire ashore to me to decypher. It proved to be the account of a disaster befallen a battalion of Nigerian W.A.F.F., who seemed to have tried to invade the Cameroon, in vicinity of Cross River, on their own account. . . . . Lugard therefore says part of the W.A.F.F.'s, who were to have been a portion of Dobell's force, have now gone up to reinforce Colonel Cunliffe, and that as casualties have been so heavy, General Dobell might wish to commandeer some officers from Sierra Leone and Gold Coast.

Naturally, I jumped at the chance of active service at once, and asked H.E. to mention my name to the General when he came up to call. This he did about mid-day, and Dobell immediately closed with the offer. I got on board " Appam," fully equipped for active service, at 4.45, and joined the Expedition. . . . .

Sunday, September 13th.—" Appam " moved out at 6 a.m. escorted by Cruiser " Challenger." On board are six Companies W.A. Regts. under Major Vaughan. . . . . etc., etc.

Monday, September 14th.—Attached temporarily to West African Regiment and appointed Ammunition Officer for voyage.

Thursday, September 17th.—Reached and lay off Lagos Bar.

Sunday, September 20th.—Appointed Chief Ordnance Officer to British Expeditionary Force.

Left Lagos 5 p.m., having taken on board a final consignment of Nigerian Survey Officers, and some trader people suddenly made Volunteer Subalterns.

Tuesday, September 22nd.—We hear that the " Dwarf " forced her way up the river some days ago, but, being herself attacked by a sort of fire-ship laden with dynamite, was a bit damaged, and had to be beached. Victoria is said to have been evacuated by the Germans, so I suppose our attack will be concentrated on Duala. Off Calaba 6 p.m.

Wednesday, September 23rd.—On deck 5.30 ; found we were already in German waters. Colonel Gorges held palaver of Staff and Officers Commanding at mid-day, expounding to us, as far as he knew it himself (and subject to all revision and reserve), the plan of the campaign, based on bush-paths leading from Debomba Creek.

Thursday, September 24th.—Having to ascertain exactly what ordnance stores are on board each ship, and being unable to communicate with most of them, decided to go round the fleet. . . . . On return found that my new assistant, an ex-trader with honorary rank of Lieutenant, one Carmody, had arrived.

Friday, September 25th.—A tremendously busy day, getting down ammunition for First Line Transport, hustling carriers, dishing out Mark VII. rifles, and interviewing Staff Officers.

In afternoon began loading ammunition, picks, shovels, barbed wire, sacks, etc., on to branch steamer " Marina."

Saturday, September 26th.—Started loading reserve ammunition on to lighters attached to River Steamers, " Alligator " and " Crocodile " at 2.30 a.m. They and the " Marina " pushed off for Debomba Creek 5 a.m., laden to brim with West African Regiment, Section R.A., and some 2,000 carriers; whilst British H.Q. Staff (less Transport Officer and myself) pushed off on " Niger," with 1st Nigerian Regiment and remaining section of artillery, on " Lokoja " an hour later.

" Challenger " yesterday picked up some mines, but didn't get up to Duala. " Dwarf " was apparently having a little scrap on her own account. . . . . Spent most of the day looking round in hold, with interludes on deck, watching the " Challenger " eight miles up river shelling Duala, the wharf of which she set on fire. Duala fired some 32 shells in return, none of which hit the cruiser, but two large mines were exploded near her. The landing party returned in evening, their attempt having proved abortive; landing place selected was impossible, and the two companies of W.A.R. put ashore, having spent from 8.30 to 2.30 trying to cut their way through a mangrove swamp, had to return to the ships. Further up Debomba Creek, at Pitti Bridge, the Gold Coast Pioneers met a strongly entrenched force of the enemy, and, having had several casualties while still in the boats, were forced also to return.

Sunday, September 27th.—News from " Cumberland " mid-day: " Duala surrendered unconditionally." The General, Charvet and Co., returned in evening, having made a triumphal entry into Duala. . . . .

Germans have only surrendered Duala itself and a mile or so all round. They are reported to have proceeded North and East, in two divisions, leaving only a garrison of one Lieutenant and 25 men in Duala and another Lieutenant and a squad in Bonaberi, off side of the river. A great many white trader men have also surrendered. British flag alone was hoisted at first, as the French Colonel hadn't one with him.

Monday, September 28th.—Received order 11.30 p.m. yesterday to provide a quantity of picks and shovels for the General. He turned up about 9 o'clock unexpectedly, and his own launch not having arrived, went off to take formal possession of Duala perched on the business ends of 25 picks! . . . . Rumours that all ships were going up river to land the troops, but meanwhile, a party of Marines from " Challenger " and the " Niger," and " Lokoja," with 1st Nigerian Regiment have gone along to overawe the natives inclined to loot.

In the evening he (the General) arrived back with some of the prisoners, also a lot of horrible looking German priests, one of the latter (convicted of having constructed a marine infernal machine and sailed it down river under the white flag), has been handed over to the French.

Wednesday, September 30th.—Started loading ordnance stores; loading up till 11 a.m., when I boarded " Lokoja," in command of a Company W.A. Regiment, Machine Gun Section; section Sierra Leone Artillery, with two 2-95 mm. guns; detachment R.E., Telegraph Section, and also the Chaplain, Rev. B. C. Pounell.

Had to gang warily, as there are some 24 mines still floating loose. . . . . Landed at once, found the Transport and Supplies living in a

veritable palace (the Wöermann Agency) and my utterly inadequate store away in a corner of their compound!

Thursday, October 1st.—Up 5.30. Went down to wharf to start off-loading stores and ammunition from "Lokoja"; having gone out last night, and after asking for 500 carriers from Hodgson, secured 100! Totally inadequate for the job, so while kicking my heels waiting for return of the gang, I wrote a comprehensive letter to Staff Captain (Savile, Royal Fusiliers), pointing out the utter inadequacy of arrangements for my department, both as to storage accommodation and personnel. Suggested the fine railway goods shed as suitable for former, and asked for at least 200 carriers, and not less than two N.C.O.'s and an Orderly. Letter came back: "all agreed to . . . "

Rushed round, seeing Hodgson *re* carriers, railway authorities *re* goods stores, and finally breaking into the shed to find it full of supplies; occupied remainder of day taking them down to A.S.C. with my 200 Hausa carriers.

Friday, October 2nd.—Three European N.C.O.'s reported for duty during day, two sergeants and a civilian armourer.

Put Hirst (armourer) on to tackle two captured German guns; arranged for ammunition, water carriers, etc., for a small naval gun detachment going up the line, where the French had a difficulty in repelling an attack this morning, as the Germans, a few miles out, have some powerful guns.

Rumours of a detachment defeated up Japoma way. Germans seem to be butchering natives as they go along, and deserters are beginning to come in. . . . . Visited the finely equipped barracks, whose contents, rifles, ammunition, gun fittings, machinery, maxim belts, saddlery, uniforms, etc., are now in my charge as "Chief Ordnance Officer."

Monday, October 5th.—Taking over German ordnance stores at the Barracks; quantities of belts and pouches, excellent "tentes d'abris," which I issued to the troops. Saddlery, also a quantity of neck gyves, apparently used for shackling natives two and two by the neck. A certain amount of uniform, caps, badges, etc., and a great number of belts of "Spitz" cartridge ammunition for machine guns.

Wednesday, October 7th.—Received some 250 rounds of German shell, said by Artillery Officers to be liable to go off at any minute.

Tuesday, October 8th.—Issued cable, ropes, etc., to R.E., for carriage on first train to Japoma Bridge. The French took over this section in course of morning. Another 250 rounds German explosives arrived. Went to the German Barracks and took over the stores there, including a splendidly equipped boot and clothes repairing shop.

Friday, October 9th.—Rushed shell and S.A.A. to wharf, packing on "Alligator" and lighters, to replace large expenditure at Jabassi, 50 miles north, up Wuri River, where Colonel Gorges' Column had a severe fight yesterday. They seem to have entered the town without opposition, and fallen into an ambush, being suddenly and unexpectedly fired on from all sides, and compelled to retire.

Saturday, October 10th.—Alarms and excursions in the afternoon, as the Jabassi Column for some reason, having received its check yesterday, has rushed back here, and began to arrive with all its bag and baggage and its reserve ammunition, etc., during the day.

Monday, October 12th.—Men of Expedition, 1st Nigeria Regiment, Composite Battalion (Sierra Leone and Gold Coast W.A.F.F.), S.L. Gunners, and G.C. Gunners, embarked 3.30 a.m. Went all over the fine store of the Basler Mission (ostensibly a religio-commercial institution, actually a semi-military depot, with Mausers buried in back garden), to see what contents likely to be of use to Ordnance. Savile dropped in with news that the G.O.C. wanted to hand over railway goods shed to the French, and was very anxious for me to inspect the big " George Steyer's Store " on river front, with a view to making it my Ordnance Depot. Did this, and found it quite good for the purpose.

Tuesday, October 13th.—My appointment as Chief Ordnance Officer confirmed.

Wednesday, October 14th.—Much uplifted in afternoon by note from Savile ending :—" I was told to let you know that the G.O.C. has made a note of the excellent work you have been doing."

Friday, October 16th.—Up to Basler Mission and brought away a hose cart with various appliances, a quantity of German rifles (ranging from " Tower " trade guns, the old " Brown Bess " to modern Mausers), and ammunition, a large supply of hats, boots, khaki cloth, etc., and some stationery ; also a dozen " Adler " typewriters.

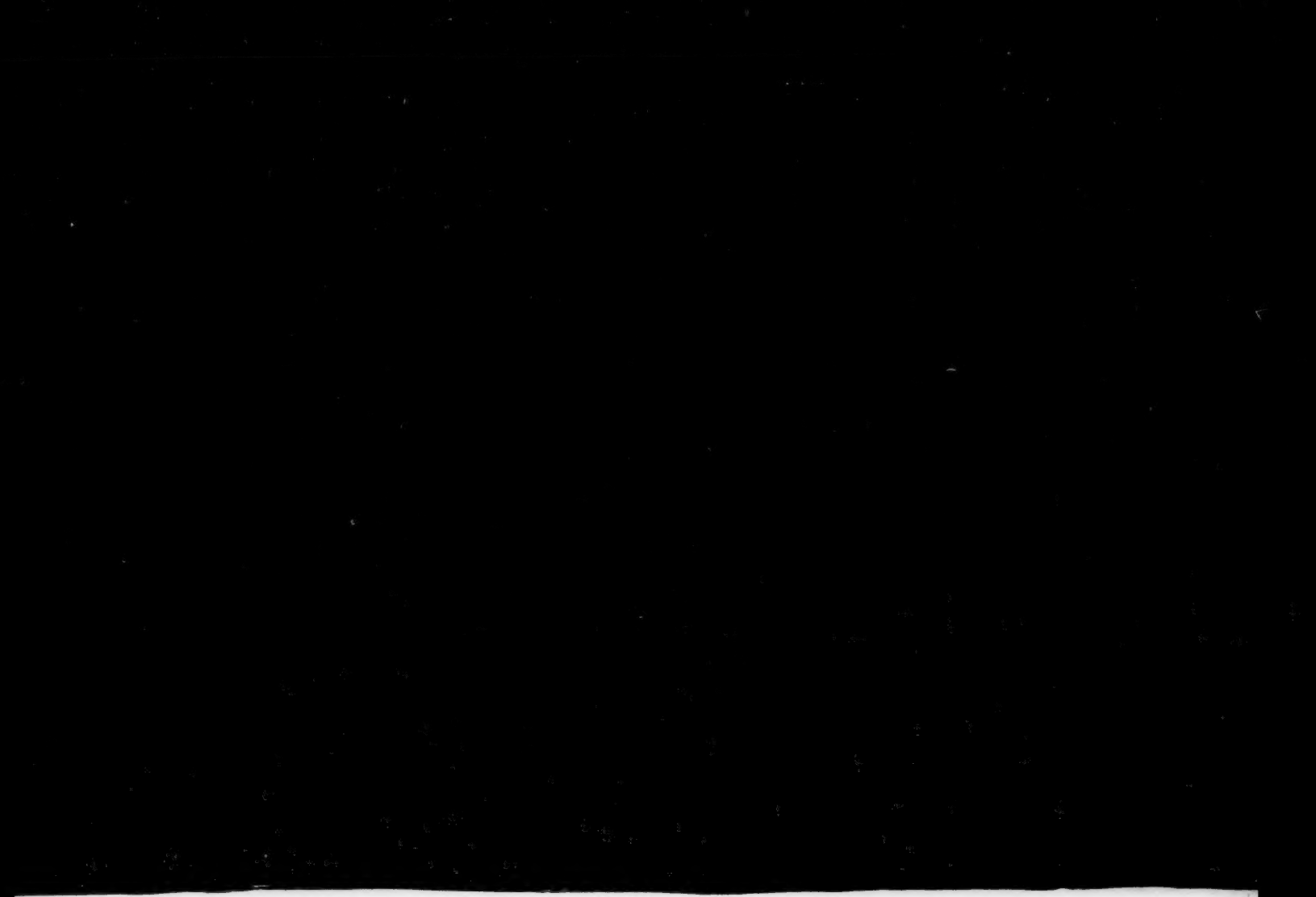
Saturday, October 17th.—I have a vast quantity in store now ; what with English naval and military and German stocks. Those of latter brought in by Colonel Rose, and the Composite Battalion from Jabassi (surrendered without firing a shot during day).

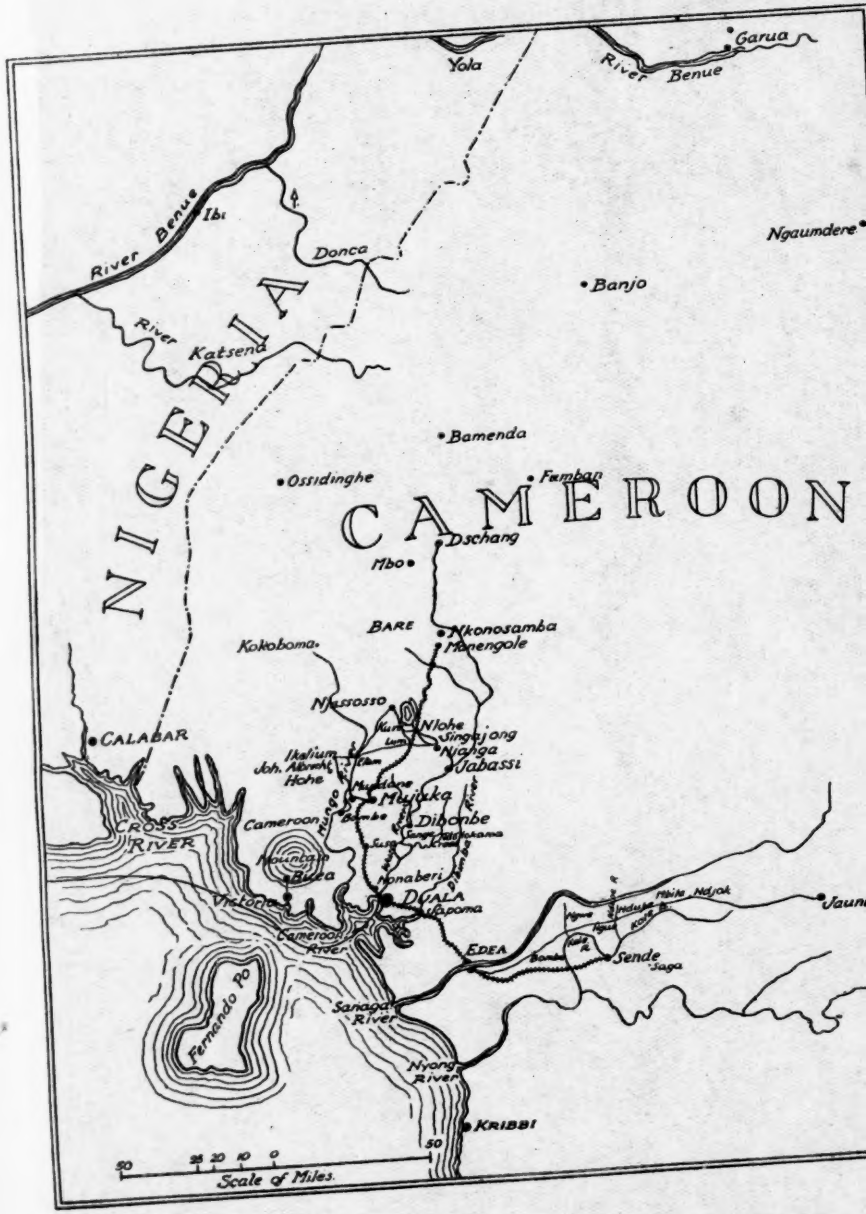
Monday, October 19th.—Commandeering stock from various stores, and kept 100 carriers busy toting blankets, spurs, clothing, blue and white linen (for signalling flags), boots, and almost every conceivable thing down to the depot.

Tuesday, October 20th.—There has been a fight at Susa, 34 miles up Northern line from Bonaberi, and Colonel Haywood's Column has had several white casualties. The French went off to-day under Colonel Mayer, to Lanaga and Njong Creeks, converging on Edea. Harper's lot are bound for same place, following rail line.

Wednesday, October 21st.—Drying sand-bags (really kernel bags, in bales of 300), and starting books.

Thursday, October 22nd.—Spent morning getting things straighter, ready for a visit from Colonel Gorges, who congratulated us strongly on the appearance of the depot. Went on with him to have a look at the Basle Mission Store, in French Duala, full to the brim of valuable things. Incidentally commandeered (on receipt) 3,000 matchets, from King & Co.'s Store. . . . . " Fuller " (stern wheel steamer), " Vampire " (river boat), " Cumberland's " picket boat, and others came in with several wounded, and two Companies of the W.A. Regiment, from

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Fumban
Dschang
Mbo
BARE
Nkonosamba
Monengole
Kokoboma
Nassosso
Nkohe
Singkajong
Njahga
Jabassi
CALABAR
Ikelium
Joh. Albrecht Hohe
Mudeka
Dibombe
Cameroon Mountain
CROSS RIVER
Buea
Victoria
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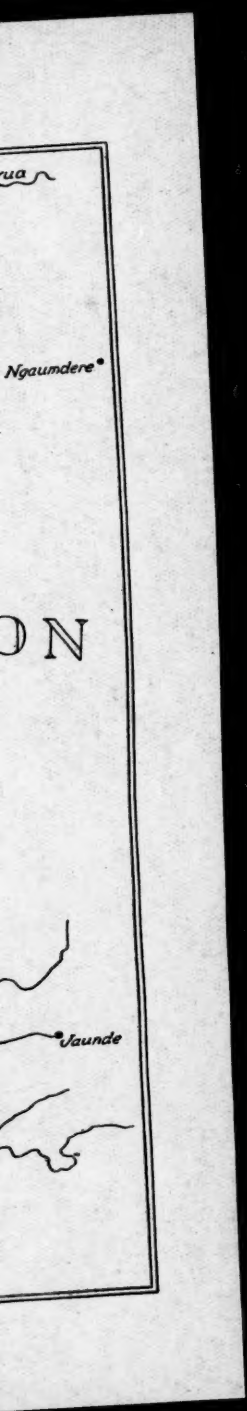
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Kwa-Kwa Creek, where they came under a hot fire. . . . . They returned, as no sign of the French troops they were supposed to meet in Lanaga Creek, up to 12 hours after scheduled time, and landing was impossible. Got ready ammunition for a fresh expedition going off in same boats.

Friday, October 23rd.—In afternoon went along and commandeered beds, etc., from lower Basle Mission, and toted them up to hospital, badly in need of them.

Saturday, October 24th.—Three European N.C.O.'s having been sent to help, took stock in the morning. . . . .

Monday, October 26th.—Just as we were closing, and had sent all our carriers laden up to the hospital, in came the " Lagos," with troops, stores and mails, transhipped from the " Falaba." New troops from Sierra Leone—a Company W.A.R., under Major Law, and the signallers, W.I.R., under Captain Carleton. French are not yet in Edea, they find the mangroves quite impossible round the creeks, and the Germans with maxims are said to be strongly entrenched there.

Tuesday, October 27th.—Several French troop-ships, with supplies aboard, chiefly thousands of barrels of " Vin Rouge," at the wharves.

Wednesday, October 28th.—Edea fell yesterday.

Friday, October 30th.—West Africans returned from Edea in course of day. Not a shot was fired, so far as they were concerned. What fighting there was, was done by the French. The Germans have retired to Jaunde.

Saturday, October 31st.—Lanaga Creek Expedition returned. . . . . " Vampire " towing a lighter load of Composite Battalion off on a new expedition.

Sunday, November 1st.—Supplied ammunition to three companies and machine gun section, W.A.R., and sent off saddlery, 1st Nigerian Regiment, in care of section S.L. Artillery ; all off to form new garrison at Jabassi, and going up in lighters drawn by " Myrtle," launches, and naval picket boats. . . . When the Jabassi circus got under way, a new pantomime arrived in French transport " Niemen," two more companies W.A.R., some French troops and carriers from Dehane on the Njong Creek.

Monday, November 2nd.—Visit from Major Best, who told me of the new plan of campaign. It is being given out that the expedition is starting for Kribi, actually it is a series of converging movements on Buea (Government Station, on slope of Cameroon Mountain, overlooking Victoria), via Lopo, from Victoria (Naval Brigade), Susa, and Duala, via the Creeks, and will apparently take almost all the garrison from here.

Sunday, November 8th.—Down to the Ordnance Wharf at 6.30, to get the 24-cwt. case of Hotchkiss mountings ashore from the lighter. Did it by aid of 100 carriers and a crane, and solved problem of getting it across road and into depot by commandeering planks and oxygen cylinders from Marinetruppen.

Tuesday, November 10th.—Continual whirl of detail issues in connection with the coming "move"; commandeered khaki cloth, etc., from Basle Mission, for Senegalese Tirailleurs.

Wednesday, November 11th.—Sub-Lieutenant from "Cumberland" drew one of the Hotchkiss quick firers to put on "Fuller"; a French Lieutenant bought boots; Composite Battalion and 1st Nigerian Regiment drew S.A.A.; Nigerian artillery, shrapnel, double common and case; likewise Gold Coast Artillery. Put second and third echelon ammunition and entrenching tools on ss. "Lagos."

Thursday, November 12th.—Buea Expedition off from daylight onwards.

Friday, November 13th.—Heavy cannonading audible from the direction of Victoria, at 9 a.m. Heard later, it was the "Dreadnought's" 6-inch guns in Tiko Creek, bombarding Tiko trenches, and, later on still, that Tiko had surrendered. Went off in surf boat to Akwa Town Store, and "pulled" 1,000 more yards khaki and some lamps and crockery.

Tuesday, November 17th.—To see Giles, re trains on Northern Railway, as Colonel Vaughan, off on inspection trip Susa to-morrow, has offered to take me with him, and I have got a day's leave from Colonel Turner.

Wednesday, November 18th.—Up 5.30 a.m., proceeding armed and equipped with revolvers, cameras, haversacks, maps, and other warlike paraphernalia, including an armed orderly, to the Government Wharf, where was joined shortly after by Colonel Vaughan (and others), all embarking in the "Wuri," for transition to Bonaberi. There found our train for Susa. Moved off about 8.15, reaching first stopping place, Maka, after a journey over extensive swamps, and across a girder bridge damaged by Germans, and shored up temporarily, over the broad Bomono Creek, at Bepele. At Maka is a large palm-kernel factory, and soon after leaving it, the character of the country changes, and one enters thick bush, so close that it brushes against the trucks, varied by luxuriant palm groves, and acres of flourishing bananas. Sometimes the thick low scrub of Sierra Leone Protectorate, more often wild West African forest, great trees hung and festooned with creepers, lianes, and tendrils. An orgy of luxuriant vegetation, but always with man-high undergrowth, varied by mauve convolvuli and large ferns. At Susa, Colonel Vaughan came to end of his command, but I decided to go on to railhead, within three kilometres of the real front, where Colonel Haywood's Northern Column is resting. At Hake is a small outpost, and just beyond it a deep cutting, where Colonel Haywood was ambushed not long ago, and had some dozen casualties. German trenches are still to be seen up the line, in temporary clearings, here and there occupied by a tiny post, perhaps a black lance-corporal and three men, then a gap of ten miles. . . . . Further up the line, after a gap of a quarter of a mile removed by the enemy at Mujuka, the Germans have an armoured train. After passing another small outpost in middle of dense bush at Kompina, we reached Mujuka, at 11.30, and the train waited a bit while I went on towards

Hayward's camp, lately the German encampment, surrounded by splendid trenches, with good parapets, covered communication trenches, etc., in a clearing on a hill. No one can understand why the Germans evacuated it, unless the water was running short.

Thursday, November 19th.—Enemy is now said to be at Jaunde (headquarters of Lieut.-Colonel Zimmerman and the Governor Ebermayer), and at Penja and Bonasonga, up Northern line. . . . . Germans blew up line last night, half mile beyond Mujuka.

Saturday, November 28th.—Big rush at depot. All of the Staff now back from Buea. Northern Column are at Johann Albrechts-Höhe, 20 miles north of Mujuka, and 700 Germans somewhere in the neighbourhood; Major Law and some West Africans a few miles to the East; Colonel Rose at Sopo and Buea; and Colonel Cockburn marching north from latter place. Von Engelbrechten is with the 700 up north.

Sunday, November 29th.—Met several of the Staff, who are off on the new show Tuesday, including Wallace Wright, who gave me a broad hint that if I put in for a short "leave" I might be able to go with them.

Monday, November 30th.—"Leave," or rather change of scene and job, approved of both by Colonel Gorges and General Dobell. I go off to Mujuka, attached to Staff of O.C. British Contingent to-morrow.

Tuesday, December 1st.—Joined Colonel Gorges at Ordnance Wharf 6.30 a.m. with Souri (my servant) and my orderly. Arrived at Mujuka Camp about 11.30, at present occupied by Colonel Haywood and 2nd Nigerian Regiment. Colonel Cockburn, with 1st arrives to-morrow, and forward movement begins the next day. . . . . Colonel Gorges offered me billet of Officer Commanding lines of communication, with three companies of different regiments scattered up and down the line, and which will naturally get longer and thinner as the Expedition moves further up, and I accepted with alacrity.

Wednesday, December 2nd.—Interviewed Wallace Wright, who gave me some details as to present distribution of troops on lines of communication. (The diary gives details of distribution, but Major Griffith, by personal inquiry on telephone, and by questioning Officers in camp, found out that most of the H.Q. information was wrong). Real distribution was, one Officer and 32 men Bonaberi; one Officer and 30 men, W.A.R. Bepele Bridge; one Officer and 15 men Susa; one Officer and 27 men Hake; C. Company, Sierra Leone W.A.F.F.; one Officer and 31 men F. Company, Gold Coast, W.A.F.F. Kompina; and H.Q. of *both* companies here at Mujuka, so that C. and F. are badly mixed up. Decided first thing to do, in addition to making moves, was to disentangle the companies and get, at any rate, one complete one here, and, after consultation with Anderson, O.C. C. Company, evolved the following:—W.A.R. Bonaberi, one Officer and 25 men; Bepele Bridge, one British N.C.O. and 15 men; Maka, 7 men; Susa, one Officer and 15 men; C. Company, Hake, one Officer and 20 men; Kompina, one Officer and 30 men; Mujuka, two Officers and 41 men; F Company, two Officers and 120 men, and, in addition, one section Sierra Leone Artillery and

a machine-gun section, Colonel Cockburn's Column, No. 1 Nigeria Regiment, giving Column a strength of some 70 Officers and 1,960 men, exclusive of carriers.

Thursday, December 3rd.—Column moved out at 7 a.m., leaving me, as Southern moves are not yet completed, with about eight Officers and 140 soldiers in camp. Decided to make two redoubts or blockhouses inside the outer ring of trenches (perimeter too big to hold), and to destroy all the outlying palm houses, as being in the way and obstructing the field of fire. Machine-gun to be in one block house, 2.95 gun in the other. Several telegrams during day, which I sent off by runner to Mundek (nine kilometres north), the Column camping place.

Friday, December 4th.—Column had apparently already moved up the line towards Penja, 17 kilometres north of Mundek. In accordance with wire from H.Q. late last night, sent on Lieutenant Magee, who came in by train from Nkongpina, and 30 men F. Company Gold Coast, to form garrison of Penja, on first train that ran there (1 p.m.). Orders in evening for Carleton to be attached to me as a sort of Staff Officer. Wired *re* post between Mundek and Penja, as 17 kilometres quite unprotected; but Wright replied he thought no need. Decided to send Carleton north to see and report.

Saturday, December 5th.—Trains now meet here, Penja one returning to Penja and southern one to Bonaberi. Column has now moved north from Penja to Lum.

Sunday, December 6th.—Three natives came in, sent by Kings of Mundame, Malende and Mambanda (north of first named), reporting two German Officers and plenty of men at Kiliwindi, two days trek from here, and now left behind by Gibb and Poyntz. Wired H.Q. the information, and sent out Ewen with small patrol to Mundame to get more news. Finding none he went on to Malende, and getting news of ten German whites and 100 men moving on Etam, sent in messenger to me to say he was moving on latter place, and would be out all night. Wired this also to H.Q.

Main Column advance guard had a bad knock last night at Nlohe, Lieutenant Schneider, R.E., with Colour-Sergeant Luxford and a small party running into an ambush with two machine guns. Schneider killed, Luxford wounded, and eight or nine native casualties. Got wire from Colonel Gorges early, to say bridge at Nlohe blown up, and train with wounded from Bonaberi coming down shortly. Wire from H.Q. to send strong garrison to Lum to-morrow, so ordered Magee to move there from Penja, and Ripley to replace him from here. Late in the afternoon, another wire, one officer and 25 men to be sent to Nlohe, for protection of destroyed bridge. After much telephoning, made following arrangements:—Magee and 25 men to move from Penja to Nlohe, Ripley and 30 men to go by train from here to Lum, Roberts and 20 men to withdraw from Kompina and proceed straight through to Penja, Beattie to send five men to Kompina from Hake, and Olive to evacuate Maka and send its five men to re-inforce Beattie.

Monday, December 7th.—Entrained at mid-day in northward bound train, inspected posts at Mundek and Njombe, having passed through some interesting open country, with enormous banana, tobacco, and rubber plantations, and the fine 1,000 ft. high mountain covered with grass, like Sussex Downs in appearance, volcanic, as testified by lava on the line at "Kilo 84," near Dynungo Station (1.25). Reported all clear. Reached Penja, a simple wayside station in the bush, 2.10; Lum 3.45 (dropping Roberts and 20 men at former, and Ripley with 30 at latter); and Nlohe, 5.20. Column is at Lala, 12 kilometres further on. Not easy in our minds, as Nlohe is a quite impossible position to hold with only 25 men. Station down in a hollow, with cutting each end. Moreover, one company of Germans is said to have retired with its machine-gun westwards, i.e., on *this* bank of the river; and possibly, another eastwards, not to mention the lot young Ewen is tracking. Dibombe River very fine, glorious rapids and falls, and bridge completely overturned into it. Restless night, as Wright was anxious about convoy of supplies, which left here (by carriers of course, bridge being destroyed), 8 p.m., and had not reached Lala by 3 a.m. Moreover, had to wire Ripley to leave Lum and come in here daybreak, as this place is going to be the Advanced Base for the present, and hopeless to defend with less than 50 men.

Tuesday, December 8th.—Despatches in, in afternoon, from Gibbs' Column, on right bank of Dibombe—short of supplies, delayed crossing Mungo by collapse of Berthon boat and by bad bush country. Also, note from Anderson, with further news of Germans at Kiliwindi and Etan.

Wednesday, December 9th.—Wired Mujuka to send me 20 more men, as perpetual escorts leave no men at all for work on defences. Remainder gun ammunition and 20 men F. Company arrived by afternoon train. Runners in 5 p.m. from Gibb (Eko River), and Captain Browne, W.A.R., in touch with 28 German white men and 200 soldiers fleeing from Jabassi. 7.30 p.m., wire from B.H.Q., shortly establishing post between railhead and Nlohe.

Thursday, December 10th.—Defence works and supply depot established on hill, west of cutting, overlooking river. More runners in from Browne in afternoon. Minniken has found a 1913 German machine-gun in perfect working order. Hearing unofficially that Column had arrived at railhead, Nkongsamba, wired to know if convoy on way, and condition of rolling stock there. Reply - 23 German prisoners, six women, three children, one wounded British Officer, leaving for Manengole to-morrow, to send to meet at latter place (26 kilometres, some 20 miles north of here), one Officer, Medical Officer and escort. Post going to be established at Manengole. Decided to go myself.

Friday, December 11th.—Hodgson's supply convoy (large railway truck drawn by four mules and 100 carriers) left 7 a.m., escorted by Lieutenant Fawcett and 20 men Nigeria Regiment, returning to duty from hospital. To avoid confusion my column moved out an hour later,

but as the mule harness broke a mile out, we very soon overtook and passed them. Fine scenery to Lala, four kilometres out, open country flanked by rocky Kupé on one hand and wooded Manengoting on the other—substituting 14 ft. elephant grass and banana groves for corn and grasslands, not at all unlike the Black Forest. Kept to railway line all the way, very bad going as no path, and a line packed with flint-like lava, also an up gradient all the time. Had two hours out-span at Manjo Station, moving on at 2 p.m. Hodgson's truck had meanwhile come in. I pushed on ahead, reached Manengole (kilo. 141), 4 o'clock. Found no sign of Northern Column, which was coming on down incline and which we quite expected to be there. Inspected bush round, and decided on outpost positions, placed guards, built palm shelters for wounded and women (no " Station " at all, merely a sign-board and water tank), and sat down to much needed cup of tea with D'Amico (Medical Officer). Suddenly, round the curve from north flashed a huge truck, screaming women waving and shrieking, chairs projecting, a small trolley running in front, and ropes trailing behind. The fools at B.H.Q. had sent the women in a brakeless truck, on a gradient of 1 in 60, and the carriers had to let go the drag ropes! D'Amico and I rushed at the ropes and managed to grab them, but were simply swept off our feet. The thing must have been going at 30 miles an hour. The African picket, after the manner of the apes, merely stood and gaped, while the truck, with D'Amico and I like aeroplanes behind, made for the cutting. Either our presence encouraged the women, or we actually did slow the thing down a trifle, but the women leaped off, two with children in their arms, and lay groaning on the ground, while the truck and trolley dashed on to meet Hodgson's mules! We gathered up the women and children, providentially only shaken, cut and bruised, not seriously hurt, rendered first aid, and gave them our beds, blankets, everything. . . . . No damage had been done except that a black carrier had been knocked down and killed further up. Even Hodgson had been able to get his mules unhitched before the collision, and brought both trucks in before nightfall.

Sunday, December 13th.—At Nlohe. Saville appeared from north in trolley " en route " Duala, and says Colonel Gorges is delighted with my work as O.C. Lines of Communication, so no question of my having to return to my hated depot to-morrow. Received cypher wire from B.H.Q., escort with European to leave to-morrow to meet 600 carriers (ordered Ripley off this trip, leaves me the only officer here), and Mujuka to cease to be a base; 2.95 gun for here; maxim for Nkongsamba; and I to garrison line up to and including both. Permission asked from Duala to evacuate all posts south of Mujuka for this purpose. Asked B.H.Q. to instruct Magee, on arrival, to form post at Manengole, and ordered Anderson to send remainder F. Company and the two guns here as soon as railway arrangements permitted.

Monday, December 14th—11 a.m. Three wires from B.H.Q. (*a*) 21 males, 17 females, 7 children prisoners of war leaving at 7 a.m.;

escort to be provided (two out already). (*b*) Basle Mission at Nyassasso, order all in, sending escort if necessary. (*c*) All posts south of Mujuka may be evacuated, except Bonaberi and Bepele. Wired O.C. Bonaberi to send Matthews here with 15 men from Susa, five from Bepele, and five from Hake. Train from south 3 p.m. brought Dr. D'Amico for here, and Lieutenant Hordern, R.N., for railhead. At 4.15, a very unexpected joy arrived in the shape of 21 male, 17 female (half of them in breeches, slouch hats and revolvers—you never saw such a circus), and seven kiddy prisoners of war. They are the limit, these people! Filthy brutes too, no use for latrines or any decent usages.

Tuesday, December 15th.—Ripley went off with native guide and ten men to "pull" Basle Mission, Nyassasso. Convoy of 600 carriers, escorted by Giles, R.N., who brought prisoners in yesterday. Hordern and Dr. Telfer left for railhead. Roberts in in morning with 20 men C. Company from Penja, and Matthews by train in afternoon with 26 W.A.R., and Sergt.-Major Mackintosh with one 2.95 gun and Section S.L.R.G.A.

Wednesday, December 16th.—Ripley still at Nyassasso. I sent Roberts out with 11 men to relieve him, and bring in the missionaries. No sooner done this than there came a wire from Anderson at Mujuka, "Chief of Ikiliwindi in from there to say Germans occupying it with post at Kumba." Wired this to B.H.Q. and received prompt reply—"Send out strong officer's patrol (about half company) from troops you were going to send up here, and clear up situation at Ikiliwindi." Got on 'phone to Anderson, after studying maps, and asked him to despatch 30 men to Kumba, and I would move on to Ikiliwindi, each attacking, if possible, at daybreak—but meanwhile have not enough troops! Sending on, however, Matthews with his 26, two West Indian Signallers, dresser and stretcher party, to join up with Roberts' 11 at Nyassasso, which is on direct road to Etam, and that connected with Ikiliwindi, I believe, by bush path. If Ewen and his 40 arrive this afternoon, I propose to take another section out to re-inforce Matthews; Ripley to come here at once. At 12.30, Matthews and W.A.R. moved out. 4 p.m., Ewen and his 40 men tottered in, having been on the march over lava strewn line since daybreak.

Obviously hopeless for my purpose, as I proposed to do a 20 mile night march, and fight at daybreak. I therefore, got hold of F. Company Sergt.-Major, and told him to select 20 of his men from those on guard and replace by the new-comers. At 4.30, the Sergt.-Major, 20 men, myself, my orderly, and one carrier, paraded and marched north, led by guide provided by local King, who swore he knew way to Nyassasso by day or night. No food except a biscuit in our haversacks, no blankets, no nothing.

(This expedition came to nought, and had to return to camp, where it arrived at 2 a.m. Major Griffiths' account is interesting and picturesque, but too long to reproduce here).

Thursday, December 17th.—Found wires awaiting me, received by Ewen. "Colonel does not wish you to leave Lines of Communication

without very good reason." Wired B.H.Q. full reasons for going out myself, and informing them of safe return. Sent Ewen with 20 men by train to Penja, to try and cut across to Etam, and join up with Matthews there. Mid-day, Ripley arrived back from Nyassassong, having made a forced march from 6 a.m., and reporting it to be a good 20 miles from here. Brought also report from Matthews, who reached there at 10.30 last night, and was collecting guides and "chop" preparatory to an early move on Ikiliwindi, said to be 1½ days' march, over unfordable river Mungo.

Friday, December 18th.—Mid-day, Anderson wired me, "Back at Mujuka from Ikiliwindi," which he reached yesterday. No Germans have been there past fortnight, none nearer than Kokoboma, 12 days' march north. G.H.Q. are panicking now about a village, Singajong, ten miles east of here, where they have been informed Germans have an entrenched position. I am quite sure there are no Germans anywhere near, but am sending a local spy, and a small patrol to make sure. First train came down from Nkongsamba (engine temporarily running with one piston rod), and reached other side of river at 1.30. B.H.Q. anxious for garrison of Nkongsamba to reach there to-morrow, so I have ordered Ripley to move there with all available men, leaving only those on guard, in the hope that the others will come in early the following day.

Saturday, December 19th.—5.30 a.m. Wired B.H.Q. proposed to visit Singajong myself, unless prohibited by wire, as no other officer available, and native information unreliable. Sent off patrol, corporal and two men, to precede me there. Gave Ripley last instructions as to leaving post of eight men at Mboo bridge, etc., before moving out myself, accompanied only by Amadu Kano, on my reconnaissance to Singajong. (8.30). Tramped south along railway line, looking for path shown on map, as being half-way between Nlohe and Lum. Reached latter place (four miles) without finding it, but managed to get a guide there, one Ntole of Bonandam, who assured me I could get to Singajong in three hours. After nearly two hours' walking we had to wade the Dibombe, which here winds and crosses the path twice just before getting into the small Fakai of Mosoko. Here Ntole admitted that Singajong was another two hours off, so I got fed up, and employed one Isaac. Patrol reported by natives coming through, as being an hour ahead at Bonandam. Walked on to Bonao 12.45, and to Bonandam (1.15). Having promised to be back before night could go no further, but patrol rolled up with the King of Singajong and all his Councillors, who said no Germans had been there, or in the entrenchments 1½ miles north at Bakaka, for some days, having been frightened away by Browne's Column, so I sent the patrol on, with instructions to spend the night in Singajong, and turned back with my orderly. Walked back over the Dibombe and through the forest to Lum, where we were lucky enough to catch the one train in the day to Nlohe. Beattie and 24 men C Company arrived by it, which was a comfort, as, Ripley having left, our garrison had become painfully thin. Found wire awaiting me from B.H.Q. "G.H.Q. has wired for your return. Hand over to Anderson."

Sunday, December 20th.—Wire from B.H.Q., "Your useful reconnaisance puts the seal on excellent work as Officer in Charge of Lines of Communication." . . . . Was glad to get news by runner that Matthews, Ewen, and Roberts were all on the way, and hoped to be in shortly. Matthews from Etam yesterday penetrated to Ikiliwindi by swimming the Mungo twice. So my military operations have been a great success; between us we have proved that no Germans in bulk exist between Johann Albrechtshöhe and Jabassi, some 70 miles east and west of the railway line. Patrol from Singajong also back, with Isaac, my runner, confirming reports as to non-existence of Germans near Bakaka. Anderson arrived by train and took over in afternoon. Also Ewen, Matthews, and Roberts, all footsore and weary, but quite lively, with their respective commandoes, a bit later. Roberts also brought in three men, five women and one child, German missionary folk from Basle Mission at Nyassasso, a satisfactory ending to my mission.

Monday, December 21st.—Left for south by 8 a.m. train, with the prisoners, etc. Reached Bonaberi 3.15. Thence across the estuary to Duala.

Tuesday, December 29th.—Feeling feverish. Wrote in a strong letter to B.H.Q. asking for real trained clerk or capable N.C.O. at once.

Thursday, December 31st.—Very nice letter from Colonel Gorges as to missing me on Lines of Communication. Latter has been attacked twice since I left, the Germans at last showing some enterprise. They attacked Bare at dawn one day, with two machine-guns, but were beaten off, and next day they cut telegraph line between there and the Column, and seized a bridge. There has also been a fight with main column. A company of the W.A.R. goes up there to-morrow morning.

1915.

Friday, January 1st.—Minniken's Company left 6.30 for Bonaberi and the north. Norton Harper and his company W.A.R. from Dibombe arrived in haste, having been fetched down by Bell (a middy) with urgent despatches last night, presumably to replace Minniken's Company.

Saturday, January 2nd.—Still fighting on Lines of Communication. Dr. Ward (from Mujuka) blew in to depot, and told us that Hodgson's convoy, escorted by 20 men of F. Company under Ewen, had been attacked north of Bare.

Tuesday, January 5th.—Colonel Gorges' column has entered Dschang, and the French have had a scrap between here and Edea.

Wednesday, January 6th.—Good news from Edea. The Germans attacked it in force on 4th and 5th, and were repulsed with great success —14 Europeans, including a Captain Bachmann, were killed.

Sunday, January 10th.—Heard interesting fact that the Germans have gone south from Edea and are now in force at Dehane on Njong river, between Edea and Kribi, latter being a coast town; it is just possible they are expecting the "Karlsruhe."

Saturday, January 16th.—Scrap at Bare yesterday, in process of which McClaverty fired 29 shrapnel, so am sending 20 boxes (fused) and 20 rolls barbed wire to Nkongsamba by first train.

Monday, January 18th.—A French column from the Congo has reached Dume station, 125 miles east of Jaunde, killed 41 German whites and taken 14 prisoners, and things are quite lively in my old haunts up the northern line, where Colonel Cockburn and Major Coles are wandering about with columns, trying to round up elusive bands of mounted Germans, who chip in and cut the line at intervals. A cypher wire came in from Cockburn, wants two more companies up aloft. Line has been cut at Manengole, and a scrap taken place at Ndunge, between there and Nkongsamba.

Wednesday, January 20th.—The French Congo columns have had two other successes, having captured Baturi (seven German whites killed) and Molundu, December 9th and 22nd respectively. Altogether they have accounted for 41 Europeans, including six officers, apart from the Edea lot.

Saturday, January 23rd.—Start of the Kribi expedition. Colonel Vaughan, with W. A. Regiment, its two machine-guns, a Naval machine-gun detachment, with my two guns, doctors, and transport left by " Boma."

Tuesday, January 26th.—Sent off 60 rounds of shrapnel and five coils barbed wire to McClaverty. Expecting attack at Nkongsamba. Rumour says that Vaughan and the Kribi crowd are already fighting with Zimmermann's lot. Latter stand a good chance of being hemmed in, as two French columns are at Dume Station and Lomie, one at Edea, and reinforcements going soon to Kribi.

Wednesday, January 27th.—Captain François and French mule battery back from Kribi, en route Edea. François says that a column of 400 W.A.R. and 200 Tirailleurs under " le Colonel Voggen " (Vaughan) were in action yesterday near Dehane. French Sergent de Génie, who came in in the afternoon, says Germans are on line between here and Edea, and two armoured trains gone off.

Thursday, January 28th.—Colonel Newstead and remainder of Sierra Leone " Waffs " arrived from Freetown.

Friday, January 29th.—Newstead and two companies S.L. " Waffs " and Ripley with Gold Coast Company went off up northern line.

Saturday, January 30th.—Anderson, and remainder of S.L. "Waffs," left for our old haunts at Nlohe. Rumour that Zimmermann has escaped through the Edea-Kribi cordon, and is making his way to Jabassi or Dschang.

Sunday, January 31st.—A busy morning arranging with H.M.'s Navy about stores for the sending of the 12 lb. gun team on 800 mile trip to-morrow, by the "Niger" and "Benni" to Yola, and thence across Nigerian frontier to Garua, still besieged.

Wednesday, February 3rd.— . . . . to call on Colonel Gorges, and happened to be there when wire came in from O.C. Bare. Big action

there this morning, resulting in 80 casualties on our side. We apparently attacked the German camp at dawn and captured all their reserve stores and ammunition. Enemy losses unknown.

Friday, February 5th.—It appears there were two fights near Bare simultaneously. One rather successful, under Cockburn, the other, Newstead's, a bit of a knock, so more troops are going up post haste

Saturday, February 6th.—Busy over details of new northern line expedition. Two companies W.A.R. recalled from Kribi; Gorges and Staff going up; and two machine guns wanted also.

Sunday, February 7th.—Issued two German maxims to Major Law, 20,000 rounds German ammunition, spare barrels, spare-part boxes, and sent clothing and equipment to Bonaberi, Nlohe, Dibombe and Buea. Two companies W.A.R. arrived from Kribi on "Boma," and went on up north from Bonaberi.

Tuesday, February 9th.—Carmody had letter from McClaverty, Nigerian Artillery, and I had one from Campbell, S.L.W.A.F.F. Both interesting, as describing the actions at Bare.

McClaverty says: "We stumbled on the newly made German camp, on a ridge, at 3 o'clock in the morning, while doing a night march. The Germans shouted and yelled to make us imagine they were going to charge. The fight lasted three hours, at the end of which we picked up 12 dead—no time to search in the elephant grass for more, but they must have had at least 100 casualties. Ours were 67. Our men were magnificent, no European troops could have done better."

Saturday, February 13th.—Fighting at Dibombe now. We could hear the maxims through the 'phone. Attack was beaten off, without casualties, by mid-day.

Tuesday, February 16th.—Attended to the wants of 1st Nigerian Regiment, Officers, N.C.O.'s and men off to Soffo and Buea. They started 2 p.m.

Wednesday, February 17th.—Alarms and excursions, there being, apparently, 500 Germans in the immediate neighbourhood, camped a bare ten miles away, and according to native information, on the way to eat us up. We have at present three men and a boy in garrison, so when the alarm was first raised, 4 p.m., a 12-pdr. gun team was hastily landed from the "Challenger," followed by a naval landing party, and the garrisons of Bonaberi and (part of) Dibombe were sent for.

Friday, February 19th.—Latest of yesterday's scare: A French patrol has visited Lobeshoe, where the German post was said to be encamped, and reports not a German seen there for months.

Saturday, February 20th.—Issued 41 boxes ammunition to Major Rose's Column (Gold Coast W.A.F.F.), off at 5.30 a.m. to-morrow on expedition up the Wuri, where, in co-operation with a column from Dibombe, under Captain Thurstan (Gambia W.A.F.F.'s, with my Armourer-Sergt. Hill in temporary charge of Maxim section) they are going to try and scupper 200 Germans, reported to be near Ndokama, up the Sange Creek. Meanwhile, in another theatre of war, Colonel

Gorges has moved out from Nkongsamba in the direction of Umburuku (on Manenguba Mountain).

Tuesday, February 23rd.—Midshipman Beauchamp in afternoon, with despatches from Major Rose, now moving on Ndokama, by the Sange and Ndokama Creeks. Thurston marching cross country from Bonambassi on the Wuri to Tonjoki on the Sange, not yet arrived. Meanwhile the " fleet " is at Jokdiberg on the Sange.

Thursday, February 25th.—The " Fuller " and the " Salvator " back from Sange Creek. Usual result, not a German to be seen Ndokama, or anywhere else where our troops went. Thurston cut his way through miles of impenetrable bush, for nothing. Major Rose and my Armourer-Sergt. Hill now back here, and Thurston returned to Dibombe. Hill says they were sniped just before leaving latter place at daybreak, then cleft a road with matchets till 10 p.m. No sooner lay down to rest than a huge elephant came rushing along. Then, next day they crossed River Sange, in dug-outs at Tonjoki, joined up with Rose's Column and discovered that Germans had split up into two parties and departed.

Sunday, February 28th.—Opened the depot at 4.30 a.m., to try and pick out 40 boxes of shrapnel likely to go off if fired, as the West African Regiment have had a knock up at Mburuku (north of Bare, on the Dschang Road), and lost Andrew, killed while firing their machine gun. After taking all the shell out and re-boxing them, we could only find 24 boxes (i.e., 72 rounds), likely to be of any use, so sent them off. Helped to decypher wires from B.H.Q. It appears Vaughan had quite a knock, and retired hurriedly, leaving field telephone and wire in enemy's hands and the S.L.R.G.A. and Gold Coast Artillery between them fired 83 rounds of shrapnel. Owing to withdrawal of marines, Kribi has been evacuated.

Tuesday, March 2nd.—Probably the reverse of quiet up north, where a big forward movement has been ordered against the 700 Germans entrenched at Melong, with advanced posts at Harman's farm and Mburuku, under Captain Adametz and Sommerfeld (from Ossidinghe).

Thursday, March 4th.—No local news, except that the Germans are once more in Kribi, and probably killing the inhabitants on all sides.

Friday, March 5th.—Fight up north this morning, Dinnen and Newstead killed, McClaverty and Finch wounded, only two native soldiers killed.

Saturday, March 6th.—Latest of yesterday's fight, which took place at Harman's Farm. S.L.W.A.F.F.'s, acting as escort to McClaverty's gun, coming suddenly under severe maxim fire ; Newstead and Dinnen were killed and Finch wounded ; McClaverty was shot. He then told his Hausa Corporal to take the breech-block of the gun and leave him. This the Corporal refused to do, and fired off seven shrapnel to such effect that the Germans were driven back. The gun was then hauled out of action. Meanwhile McClaverty was lying badly hurt and un-attended out in the open road, so Colonel Statham and Captain Booth (both R.A.M.C. from Sierra Leone) and a native " dresser " went out under a hot fire and brought him in.

Wednesday, March 10th.—Board sat in morning, going through books, etc. Gave us an excellent report : " Books adequate and carefully kept. Stock in good order. Nothing to recommend except that, as a great deal of business done with the French and the Navy, we should be transferred to General instead of B.H.Q."

Thursday, March 11th.—There have been tornadoes most nights lately, and the rains began in earnest to-day.

Sunday, March 14th.—Routine orders have the following : " The Chief Ordnance Officer is transferred from the Staff of the British Contingent, to the General Headquarter Staff. The Ordnance Staff is transferred from the British Contingent to Army Headquarter Troops." So I join the Gilded Staff once more !

Monday, March 15th.—New assistant for the Ordnance, one Harper, tin miner accountant, with rank of N.C.O.

Friday, March 26th.—Dishing out Mark VI. ammunition to 2nd Nigeria Regiment, off to-morrow, as Wuri River Column, to kick the Germans out of Jabassi once more.

Wednesday, March 31st.—Baker and Leslie Smith just arrived with new company Gold Coast Regiment, " Reuter." The " Falaba," carrying, amongst other things, 26 Officers, two Nurses, and the whole of the Ordnance Quarterly Indent, torpedoed by German submarine off Milford Haven.

Friday, April 2nd.—Sierra Leone W.A.F.F.'s back here, having marched to Jabassi from Penja, and joined up with 2nd Nigeria Regiment (from here by Wuri) at former place.

Saturday, April 3rd.—Jackson and his Field Section R.E. off to join the French at Edea. Is going to repair bridge over the Kele, half way between Edea and the Eastern railhead at Sende, so this looks like a definite move on. Another disaster to Elder Dempster Line, " Dakar " being gutted by fire off Lagos. More stores for us destroyed.

Tuesday, April 6th.—Busy day, largely spent in preparing approximate returns for G.O.C., as to number of shells per gun, and number of rounds per rifle now in Cameroon. There are ten guns (2.95) and 362 rounds per gun ; 230,000 rounds with 23 machine guns, and about 980 rounds per man. Big move begins to-morrow.

Wednesday, April 7th.—Busy day, dishing out ammunition to Colonel Haywood's Edea Column, 2nd Nigeria Regiment, and Gambia W.A.F.F.'s ; left flank guard to Colonel Mayer, and the French advance on Jaunde.

Thursday, April 8th.—First half of Edea Column entrained early.

Friday, April 9th.—Another lot of Edea people entrained, including Balder's Company, 1st Nigeria Regiment.

Saturday, April 10th.—Attack possible on Mujuka to-morrow, there being a gathering of Germans at my old spot, Ikiliwindi, who may be going east on Mujuka, or north to Ossidinghe.

Sunday, April 11th.—Webb, with Drake's Company, S.L.W.A.F.F. off to Edea.

Thursday, April 15th.—Busy day, getting stores (large proportion of Quarterly Indent, which we feared sunk on " Falaba "), off "Apapa."

Sunday, April 18th.—Statham just back from Edea, where he managed to get into another scrap, a successful little battle, in which Colonel Haywood captured blockhouse at Ngwe with only a few casualties, and took a Maxim-tripod, spare-barrels, etc., gun itself missing, probably in river, crossing over which was " raison d'être " of the Fort.

Wednesday, April 21st.—Two Colt guns going up line on Friday, and G.O.C. has sanctioned the Ordnance Officer going up with them, as expert instructor.

Thursday, April 22nd.—I go up north to-morrow. Got ready the two Colts and Maxim I am taking up, German tripod, five spare barrels, three spare locks, and 4,000 rounds pointed ammunition, brought back by Hurst from Edea, being those captured at Ngwe.

Friday, April 23rd.—Left for Bonaberi by 6.30 launch, thence by Northern Express to Nkongsamba.

Sunday, April 25th.—Rode with Colonel Gorges to Bare, four miles of switchback road, with fine glimpses of ravines and Dschang Mountains at intervals. This road goes all the way to Garua (Germans are at Ikom, seven miles from Bare), and thence into Nigeria, joining up with Yola on the River Benue. Bare is a most delightful spot, 300 ft higher than Nkongsamba, and now occupied by Gold Coast Regiment under Rose.

Monday, April 26th.—Left for Bare, in charge of 160 carriers and escort W.A.R., 9 a.m. Reached Bare soon after 11 a.m. Walked back to Nkongsamba.

Tuesday, April 27th.—Left Nkongsamba 8 a.m. and reached Bonaberi 5 o'clock, thence to Duala.

Wednesday, April 28th.—Another turn of fortune's wheel, settled down in depot with a sigh, to arrears of correspondence, etc., when Rowe came in and offered me post of O.C. Lines of Communication to Haywood's Jaunde Column. I start for Edea first thing to-morrow.

Thursday, April 29th.—Entrained 7 a.m., reached Edea 12.10 p.m. Met by Captain Poole (G.C.R. " dug-out "—normally a D.C.), Base Commandant ; Lieutenant Rose, Intelligence Officer ; and Dr. Thompson, M.O. Made considerable enquiries from these officers, and also from Lieutenant Ewen, G.C.R., O.C. Convoy Escort, Transport Officer Kirwen, and Quarter-Master-Sergt. Boyle, as to matters mentioned in G.H.Q. letter of 28th. Difficulties very great on all hands, but made a start to solve them by ordering good rations to be issued to all carriers, and by going out to buy cooking pots for them. We personally dished these out in the afternoon, after which, I went off accompanied by Rose, who " no savvy French," and wanted to give some intelligence, to report to Colonel Mayer.

Friday, April 30th.—Convoy of 290 loads. Most of carriers half starved weaklings, degenerate, some without faces, others with bubos and swellings of every sort, hydrocele, guinea-worm, craw-craw, and what not. Reached half-way house at Bomba at 3 o'clock, escorted by

Ewen and 50 R. and F. Gold Coast Regiment. R.E. N.C.O.'s on road for purpose of mending bridges, but done absolutely nothing so far. All villages burned to ground, and no males visible. Many rivers and rivulets, bridges broken down or rotting away over all of them. Bad hills, and trouble with carriers approaching Bombe. Found there, Dr. Hogan in medical charge, and Lieutenant Wheeler, Commanding Escort, G.C.R., came down to meet us.

Saturday, May 1st.—Decided to move out at 2.45 a.m. Left Bombe with 310 carriers and Wheeler; crossed many rivers, wading some of them, and got into furious tornado; road very bad, full of great holes, made by elephants' feet, and water sluicing down from above, thunder and lightning. Passed a French convoy going in reverse direction, under my old friend Captain Modeste. Got to Ngwe 9 a.m. Camp on hill, reached by a concrete bridge over Nwge River, crowned by German redoubt; a most splendid piece of entrenchment, with underground rooms, sheltered pits, Maxim emplacements, etc. Haywood's Column had moved out at 6 a.m Haywood wishes me to stay here until his column has got through to Ndjok, after which, I move to that place, and he goes on towards Jaunde, joining up with Méchet's French Column. Troops left are F. Company, G.C.R. under Ripley (same as I had under me at Nlohe), and some sick details Nigeria Regiment, under Lieutenant Burke. I took over from Thurston, and thus became officially O.C. Lines of Communication. Went round defences, quite splendid German entrenchments, which could never have been taken, had not Balders and his Company of Hausas made a long détour and come up behind them, and finished up with a bayonet charge. Enemy reported five miles along Jaunde Road at Nkonjok, and strongly holding (five Europeans and fifty blacks) River Ndupe, a mile or so further on, another crowd fifty miles north, on the Sakbayeme Road.

Sunday, May 2nd.—Local carriers, having been paid off yesterday, cleared for the bush, and Nsang, the partisan leader (armed local apes), failed to round up more than 60; these I sent off with 200 permanent carriers to Bombe, escorted by Ripley and 20 men; then interrogated two prisoners, left by Haywood as suspected spies. One ex-policeman deserted from Saja on railway, French objective; says that Zimmermann is living on bananas, cocoa, yams, and palm wine, and has sent all his boxes to Jaunde. Haywood reached Nkonjok and seen no enemy. I sent a patrol of 20 soldiers out with Nsang to round up carriers. 12.30 p.m., despatch from Haywood; he has crossed Ndupe River, had a small scrap—one German killed, our casualties nil. Sent orderlies to Haywood with my despatches, and to Edea with orders for Anderson's Company. Sierra Leone W.A.F.F.'s sent to reinforce me. Patrol brought in 260 local carriers, and I located them in the Fort, and am allowing wives (ladies with tails), to bring them chop twice daily.

Monday, May 3rd.—Sent off Nsang and a strong patrol to rope in more local lights; brought back 109 altogether by 6 p.m. Two wounded natives rolled up; one with spear wound, attacked by Germans near

Sakbayeme (12 Europeans, plenty soldiers), the other shot in hand by two native soldiers, rummaging on his ground at Nbokelen, about four miles east. Sent patrol, corporal and four men, to " look see," guided by a piccan.

Tuesday, May 4th.—6 a.m., despatch from Colonel Haywood, dated right bank of Mbila River, 9 p.m. yesterday: Heavy opposition from strongly entrenched position. Doctor to accompany to-morrow's convoy and supply of ammunition. More to be asked for from Edea. I sent off Amadu (his orderly) on " Voltigeur," to Edea with this despatch. Interesting deserter from Germans in one Bachania, Court Missionary to Zimmerman's Secretary, deserted six days back, from Mbila. Says: "Bakoko (local) boys deserting, but Jaunde soldiers loyal. A Major and three machine guns at Mbila, but only eight boxes of ammunition. At Saja (French objective on railway), Zimmermann and 18 whites, with one Maxim. Ebermayer at Jaunde, no big guns." Sent this information on to Haywood, and to Rose at Edea, also ordered up half Company, S.L.W.A.F.F. French convoy got in in afternoon.

Wednesday, May 5th.—Despatches in 8.15 a.m. from Haywood. Haywood has got across Mbila, and Germans have retired.

Thursday, May 6th.—7.30 p.m. Despatch by two Partisans from Commander Méchet, advancing with Senegalese Battalion along railway, south of, and parallel to, our road, held up by Major Zimmermann, in a strong German position at Sende Bridge. Wants Haywood to create a diversion from the north.

Saturday, May 8th.—Mid-day, empty convoy back from Ndupe (half-way house to Wum-biagas Column's present habitat, just across Mbila). Despatch from Wum-Biagas: French Column still held up at Sende. One of our Partisans, captured by Germans at So-mapan, 12 kilometres south of Nkonjok, on 5th, escaped yesterday, states that Oberleutnant Priester and " plenty soldiers " on left bank of River Kele. Escorts must consequently be 100 rifles. (So-mapan is centre of a triangle, formed by Haywood, Méchet, and myself). Am establishing garrison, 30 men, at Ndupe, to try and rope in carriers there.

Sunday, May 9th.—Sent small patrol to Sakbayeme (on Sanaga, and Priester's old haunt), to report on condition of a female missionary in family way. H. says must be brought in when fit to travel. 2.40, mounted orderly from H. Hopes for big convoy, 1,000 strong, on the 11th, and is sending down 400 of his own carriers. Also ordering Gold Coast Regiment to proceed to Wum-Biagas, and remainder Sierra Leone W.A.F.F. to come here. Former company, a very strong one, and latter very weak, so garrison will again be depleted; in fact, for six hours, between departure of one convoy and arrival of another, will be literally three men and a boy! He has also forgotten the post at Ndupe, so have had to modify his orders a bit. Despatch to O.C. Convoy (from Edea), ordering him to come straight through here, as I shall be unable to afford him an escort.

Monday, May 10th.—Hodgson, Transport Boss, arrived. Also French mule convoy turned up, under Lieutenant Jarnot, and Captain Jackson and Lieutenant Biddulph, with Field Company, R.E., to repair Ndupe Bridge. Jarnot says, bridges further back, supposed to have been repaired by the R.E. Sergeants, are still hopeless for mule transport.

Tuesday, May 11th.—6 p.m. Despatches from Mayer and O.C. Base, for Haywood. Former unable to move till 20th, as Méchet has not yet taken Saja, and cannot get carriers.

Wednesday, May 12th.—My patrol in from Sakbayeme, with very smug letter from Dr. Stutz, *re* missionary there, asking that, as a Swiss, he be allowed to remain there. He had previously given a written undertaking to the Colonel, neither to help nor communicate with the enemy, and to give us early intimation of any hostile movements near Sakbayeme. Unfortunately for him this same patrol ran into a native carrying a pencilled note in German, as follows: "My dear Stutz, I am for the moment at town, Mbiathum, about two hours from Sakbayeme. For three weeks I have been on patrol without any rest, and am coming down now. I should have liked to have come to see you, but have certain news to bring over and cannot stop. To-day I am going to Song-Sintat. If it be possible, and you are not watched, I shall be glad if you will let me have, by bearer, some bread at Song-Sintat. I have not had anything to eat, and could not pay the King Mjo for the food, because I had no money. . . . . Yours (sgd.) J. Alberich." So I have ordered Captain Alexander to take ten men, and Dr. Hogan to certify woman fit to travel, and arrest Mr. Stutz and bring him in. Incidentally, of course, to get on Alberich's tracks too, if he can. Another native, brought in by patrol, reported three German whites, and 40 soldiers at Babimbi, two days north of the Sanaga. They appear bewildered, so the boy states, and are living on yams and plantains.

Saturday, May 15th.—Gordon Alexander and Hogan arrived 9 o'clock, from Sakbayeme, bring in Herr and Frau Stutz, four Kings, 50 carriers and 50 loads of chop, etc. Interviewed the Stutzs, and am inclined to believe genuine their dislike of Germany (she is a French Swiss), whom they accuse of the utmost brutality to natives, especially in Babimbi district, north of Sanaga, where one, Römisch, seems to be the moving spirit. They say they have never heard of one, Alberich, but the signature may be that of Ullerich, a merchant who has been acting as Hädicke's machine gun officer.

Monday, May 17th.—In afternoon, Partisan Ngan, with two natives I sent with him yesterday, returned with three prisoners, who had resisted and shot at him, two Dane-guns, some matchets, 18 carrier recruits, and a long procession of women, with native chop, plantations manioc, macabo, etc. 9 p.m. Letter from Colonel Mayer to me, hopes to arrive here 21st, and will take over this post, allowing our garrison to move further up. Lieutenant Mériaux, with convoy from So-Dibanga-Kele (railway column), will arrive here to-morrow, wants me to provide escort for convoy 20th, and to supply his carriers with native chop.

Tuesday, May 18th.—Guns audible from 6 a.m. onwards, too near for Haywood, perhaps a French sub-column somewhere. Urgent despatch from Poole at Ndope, dated yesterday afternoon; just heard from Haywood, 200 Germans and a machine gun at Bikogo-Bikogos, just south of Ndupe-Wum-Biagas road, and therefore, quite close to Lines of Communication, is therefore keeping back convoy escort I sent him yesterday, and Haywood has half a company at Kilo 77, where the Bikogo road comes out. "Very urgent," for Commandant Méchet, by same cyclist, but as Méchet should be at Wum-Biagas to-day, rather futile to send it here! However, raked in two runners, and sent off escorted by corporal's patrol, by road Nbokelen-Mbui-So-Dibanga.

The 200 Germans must be Dickmann from Eseka (railway), and Priester combined. Motor car and two lorries turned up from Edea, going back again 1 p.m. There will be daily 'bus service now. Dr. Ward arrived at 4 o'clock, and a convoy of 300 carriers with escort, 30 men, turned up from Wum-Biagas. Made all arrangements with Hodgson and Abadie to send it back to-morrow, with stores for Commandant Méchet, but, at 5 o'clock, got despatch, dated 10 a.m., from Colonel Haywood saying, no convoy to leave here without escort, at least 75 rifles. Cannot, therefore, send till 20th, when shall have extra 15 from Edea, and can borrow 20 Tirailleurs. At 11.30, the So-Dibanga French convoy, under Lieutenant Mériaux, arrived, having started 6 a.m. Saw no Germans, but heard guns as we did.

Wednesday, May 19th.—Convoy "locals" left for Edea. Runner in from Missionary Köster, hopes start to-morrow. Convoy from Edea, 10.45, escorted by French sergeant and 25 Tirailleurs, 13 rifles, S.L.W.A.F.F., and 520 carriers. More news in from Haywood, 3.30. One European and 30 German soldiers reported at Song-Sintat, on 15th, and hostile forces from Bikogo-Bikogos left their camp early 18th, retiring east, on Singok. Colonel Haywood's camp, at Wum-Biagas, was heavily attacked yesterday morning (his guns we heard) at breakfast time. Enemy estimated 150 strong. Wired Mayer, for leave to use the 25 Tirailleurs, who arrived this morning to make up the 75 rifles, Haywood says essential now for all convoys, otherwise should not have a man left here!

Thursday, May 20th.—2 a.m. Despatch from Haywood in code. Commandant Méchet just arrived Wum-Biagas, very short of supplies. All possible stores to be sent at once. 4 a.m., 900 French loads got out in readiness. Convoy moved out at 5.30, escorted by 15 of Mériaux' Tirailleurs, 10 G.C.R., 40 S.L.W.A.F.F., 3 orderlies. (Best I could do, as no reply from Mayer). 10 a.m. Motor in from Edea, with Colonel Statham, Lieutenant Burke and Frith. Sent off the Stutzs to Edea. Mid-day, Nsang and brother Partisan in. Saw two German white men and nine soldiers at Ngodi Hill, between Sanaga River and Song-Sintat. They say "King of Ndope a bad man," i.e., a pro-German.

Friday, May 21st.—French mule convoy, under Jarnot, arrived early. 11.30. One motor lorry from Edea. Spent day trying to arrange

quarters for the enormous influx of people arriving from all sides, and getting ready to hand over place to the French as a going concern. Statham and I met Colonel Mayer and his French Column (300 Tirailleurs and 160 carriers), which arrived about 4 o'clock. Mayer and his Staff Officer, Capitaine Ardant du Picq sick. . . . . Lieutenant Clark, R.N., with nine seamen and 12 pounder gun (the old yellow-belly of Northern stunt) arrived. Handed over Ngwe post to French Adjutant-Chief shortly after.

Saturday, May 22nd.—Column moved out at 6.30. French ahead, then ourselves, then the Naval gun, finally a French section rearguard; column nearly three miles long! Usual road through bush, crossing number of streams, spanned by more or less frail and broken log bridges. French horse fell through one of these, and the Naval gun fell off it shortly after. The gun lagged behind column considerably, several times having to cut its way through bush, or be lifted over obstacles. Outspanned at Nkonjok (Pagalans), a large clean village, 11.30 to 2.30 p.m., and moved off in full heat of day. Furious tornado caught us and remained with us from 4 to 6.30, when, drenched to the skin, we reached Ndupe. French column had got in half hour earlier. Defence arrangements utterly inadequate, and native information is that a German force was concentrated four miles N.E., and intended to attack! Despatch from Haywood that O.C., S.L.W.A.F.F. was to relieve Wheeler; latter and his 50 rifles to come on with me to Wum-Biagas. In view of fact that Alexander, doing gun escort, came in after dark, and gun's team had no change of clothing, I obtained Mayer's permission to march independently of him to-morrow, and start later.

Sunday, May 23rd.—6 a.m. Went round defences, and French column moved out. Same order of march as before. Reached broad Mbila River (scene of fight May 4th and 5th), Commandant Méchet's and Colonel Haywood's camps 11.30, and reported to C.O. Large camp about mile in length, and Germans have a post less than three miles away. The French nearest river, and partly protected by trenches of old German position, British further east, and, in centre a newly constructed redoubt and blockhouse, destined to be perimeter of small permanent garrison.

Monday, May 24th.—I have been ordered to take command of whole of Lines of Communication. 11 a.m. Despatched my first order, as O.C. Lines of Communication, Allied Forces, to Alexander, ordering him to evacuate and abandon Ndupe to-morrow. This cyclist was shot at *en route* to Ndupe and returned here. Sent out again in afternoon with small patrol, again fired on and retired. Party of carriers out for chop, had one killed.

Tuesday, May 25th.—To see Colonel Haywood at 5.30. Then, by his request, to see Colonel Mayer as to sending carriers to help Alexander from Ndupe, and scouting road in advance. 6 o'clock, two columns marched out simultaneously, sick convoy, under French escort, to Ndupe, and Colonel Haywood's Column on Jaunde road. Vise, with his 2.95's,

took up position on Gun Hill to shell the Germans out of their position (3½ miles) at Boga, when located by advance guard. Meanwhile, Thurston and Crawford made a detour on right flank, while Gibb and Ripley (advance guard) went on down the road, placing Maxim in position some 400 yards below and to end of Gun Hill. I went with them, thinking action inevitable, but as nothing had happened by 8 o'clock, thought I had better return to camp. About 11.0, two bangs from Gun Hill announced a sight of the enemy, so I rushed to my horse, Amadu seized a bike, and we sped down the road to the scene of action. Passed Gun Hill and flew on down the road through Wum-Biagas and Boga villages (not hearing any sound of firing), and finally came upon the main body (rear guard still back in camp) squatting in the ditches at side of road, at about kilometre 84, between Boga and bridge over branch stream of Mbango, at Bakaba. Group of officers (Balders, McClaverty, etc.) beamed upon me. I joined the group and watched the advance guard in dip, 200 yards further on, scouting about in the thick bush both sides of road, while Biddulph and his S.L.R.E. rigged up a temporary bridge over the stream. Suddenly a terrific fusillade, and the bullets came humming over and past, mostly going high, but a few smacking in to road and trees round about. At the moment I was standing in the middle of road, but dived rapidly into the hedge, and having nothing better to do, made a sketch of my neighbours, and of the "little man" (Colonel Haywood) strolling up and down, quite unconcerned, in middle of road. Boom, boom (German pre-historic elephant guns), hoosh (bullets of same), rat, tat, ta (Maxims), crash (a volley from advance guard in dip) . . . . and so on for half an hour. Gibb's Maxim suddenly stops firing, cotter-pin broken, nothing for it but to take side plates out; out of action with the thing!

Scribbled note to Captain Garrard, to bring up rear guard's Maxim, and to Vise, on Gun Hill, to give them a taste of shrapnel. Then, from behind and over our heads, whistles a 2.95 right over the German trench. A bit high though, better luck next time. Lower, they got it in the neck that time, the Bosches. Another one in the same place, one more, it has burst short, apparently right over our own advanced scouts; however, it hasn't hit any one and the Bosches have disappeared. The "little man" catches my eye, also Colonel Statham's, who, like me, has come out to see the fun. A nod is as good as a wink, and the Colonel and I walk back the three miles to camp with an excellent appetite for lunch. Desultory fighting went on all rest of day; scouting being difficult in the thick bush. In consequence of this delay, Colonel Mayer was unable to march with the French contingent at 2 o'clock, as intended. I received three visits from him during course of afternoon, during last of which, Gordon Alexander and the S.L.W.A.F.F. arrived, also Anderson, on way to join the column. The British Column being now away from camp, and the French still here, we were unable to withdraw into our redoubt. I, therefore, apportioned the outposts between the S.L.W.A.F.F. and the G.C. Regiment, going round myself with Gordon Alexander,

Wheeler, Capitaine Bergiron, and Lieutenant Breton respectively, to ensure points of contact. Despatched cyclist orderly with " very urgent " message to O.C. Ngwe from Colonel Mayer, *re* composition 301 French loads, leaving by convoy on 27th; this orderly was shot at when half way to Ndupe, and returned here at 5 a.m.

Wednesday, May 26th.— . . . . I therefore immediately despatched a strong patrol G.C.R., six men escorting the orderly, and a civilian cyclist to return with news of any attack to remainder of patrol, 14 men, one mile out; intending to go out myself with 30 extra men and a Maxim if any trouble. The civilian cyclist, however, returned 10.30 a.m., with information that orderly was safely through and no sign of enemy, so I recalled the patrols. In early morning, Lieutenant Shaw came in (was with advance guards scouts yesterday), with a note from Colonel Haywood, asking for more ammunition. This I sent off at once, with a despatch to Mayer, as to Ndupe orderly. At 6 a.m., Mayer and the French Column moved out, leaving me alone in my glory with 16 officers (four sick), and grand total of 430 men (including carriers and servants) in the redoubt.

Thursday, May 27th.—The Column is meeting much opposition, and it will take us some time to reach Jaunde. Meanwhile, my Lines of Communication are getting longer and thinner. They are already sniping cyclist messengers behind us, and things are not of the rosiest. We are short of many necessaries, men, water, food, etc. There is much sickness, it is a pestilential climate, the heat, the insects, the interminable thick bush, the long marches in the tropical heat—all are trying. Warfare under these conditions, arm-chair critics at home are unable to realize. . . . . I have just heard that Hauptmann Dickmann (possibly Priester too) is now in between us and Ngwe, with ten white and 200 black soldiers.

. . . . . .

Here the diary ends, Major Griffith being killed in action the next day, sacrificing himself in order to secure the safety of the sick and wounded column near Wum-Biagas.

THE DESTRUCTION OF THE VIth TURKISH ARMY.

By BRIGADIER-GENERAL A. G. WAUCHOPE, C.M.G., D.S.O.

" La victoire est une résultante d'efforts, les uns victorieux, les autres en apparence infructueux, qui convergent tous néanmoins vers un même but, tendent au même résultat : la décision ou le dénoument, qui seuls donnent la victoire. . . . ' A la guerre, tant qu'il reste quelque chose à faire rien n'est fait ' (Frédéric). . . . Et, puisqu'il y a *direction, convergence* et *resultat*, c'est que la logique règne dans les faits, y reprend tous ces droits, son impitoyable rigueur. . . . La guerre moderne, pour arriver à *ses fins* : imposer sa volonté à l'advisaire, ne reconnaît qu'un *moyen* : la destruction des forces organisées de adversaire.

" F. FOCH."

THE operations of the 1st Corps in Mesopotamia, which ended in the capture of some 12,000 Turks, are of considerable military interest apart from success of achievement.

The manœuvre whereby two cavalry brigades were placed right astride the enemy's communications, the true co-operation of cavalry and infantry whereby each arm played its proper rôle, are worthy of consideration, as indeed are the dispositions of the Turk in his rear guard actions, and his unexpected counter attack on the last evening.

The operations also form a fine example of the axiom, a little apt to be forgotten in these days, that success is only assured when a single aim is clearly defined and pursued without heed to other objects. In the manœuvre of a platoon, as in the manœuvre of an army, the main objective must be clearly defined in the mind of the commander, and it is a moot question how far the unswerving pursuit of a clearly realized object reflects itself in the valour and resolution of his men, and how far the determination and steadfastness of the men are reflected in the fixed resolve of a commander ; but without doubt the two react on each other, and strengthen each other.

On the one hand, from many examples, we may recall that it was not till the genius of Napoleon had infected the spirit of his army, that the victories of 1796–1797 were possible ; on the other hand, it was only the spirit of the Italian people in 1849 and 1859 that gave their leaders force to drive the Austrians back to the line of the Alps ; and the battles near Metz in 1870 give a good example of an army fighting bravely, but uselessly, when its commander lacks the will to conquer.

This will to victory must exist both in the spirit of the troops and in the minds of their leaders, and history offers no finer example of this combination on a great scale than the fighting of the last four years on the Western Front, when we see how the indomitable spirit of the British army was revealed in the undaunted resolution of all our leaders, until the task set in August, 1914, was at last achieved in November, 1918.

On a very much smaller scale both of space and time, the operations of which I shall now give some account also offer a true example. The aim of our Corps Commander was clear. It was the destruction of the VIth Turkish Army and, despite every obstacle and every danger, he never allowed this single purpose to be obscured, and to this end the whole strength and fortitude of the troops were directed; and the fortitude of the troops met success without stint.

The aim was clear to the Corps Commander, but to some of us who had for so long faced the enemy entrenched on the Jebel Hamrin it may have seemed that the capture of his position at Futtah was in itself a sufficient task. To others, who deemed that the occupation of a strong strategic position was still an essential, the occupation of the line of the Lesser Zab seemed the true objective; and to those to whom political considerations outweighed military, the capture of Mosul appeared of first importance. It is plain enough now that these were but secondary objects compared to the destruction of the enemy army.

The situation on the Tigris at the beginning of October was simple. More than a year had passed since the 1st Corps under General Cobbe had captured Tikrit. To Tikrit the railway had now been advanced, and 35 miles upstream the Turks, for more than a year, had been strengthening his position at Futtah. It is a position by nature of great strength, for it is by the Futtah Gorge that the Tigris forces its way through the long range of hills known as the Jebel Hamrin, and through this Gorge lies the direct road to Sharqat and Mosul. Steep, rugged hills they are, rising a thousand feet above the level of the plain; they form a strong natural barrier against any invader who attempts to advance up the Tigris valley towards Mosul.

On the right bank of the Tigris, one branch, the Jabal Makhul, swings to the north and so gives additional strength to the position. And this right flank has a further safeguard in the desert of the Shammar Arab, for in the autumn the desert is almost waterless, and so precludes any attack in force from this direction.

Two alternative methods of attack remained to the Corps Commander, to deliver a frontal attack on the entrenched position at Futtah, or to turn it by manœuvre from the left bank.

The former had the merit of simplicity, but even if successful it could not lead to the main object I have already defined, for the Turk, if driven out of Futtah, might then retire to his second position some fifteen miles upstream, above the confluence of the Lesser Zab and the Tigris.

But the third alternative, could it be achieved, promised the destruction of the VIth Turkish army. This plan was therefore adopted.

It was determined, by an advance on the left bank, to force the enemy out of his Futtah position; then, having secured a crossing over the Zab, a cavalry brigade should move up the Tigris, ford that river, and so establish themselves right across the enemy's line of retreat to Mosul. In the meantime the infantry should advance up the Tigris and drive the enemy back till he was hemmed in between the two forces. This third plan was the scheme adopted because, though very bold in conception, its success ensured the destruction of the Turkish army.

The first task, therefore, was to turn the enemy out of the Futtah position, but before dealing with the operations it will be well to state the forces on either side, on October 23rd (see Map I.) On the right bank, entrenched about 2,000 yards from the Turkish position at Futtah, were the 51st and 52nd Brigades, the former nearest the river. Supporting these two brigades were 48 field guns and howitzers. In reserve at Khan Shuramiyah were the 34th Infantry Brigade and 24 guns.

A squadron of 32nd Lancers was on the Sharqat desert road, about eight miles N.W. of Shuramiyah, watching the Turkish right flank.

Opposing the 17th Division on the right bank were the 43rd Regiment in the Futtah position, and a squadron of cavalry with 12 guns. North of Futtah, towards Mushaq, were the 9th Turkish regiment with 10 guns.

On the left bank, the 54th Brigade were advancing along the top of the Jebel, with the 55th Brigade in readiness to assault the Turkish position on the southern slopes. Supporting the 18th Division were 36 field guns and howitzers and eight mountain guns.

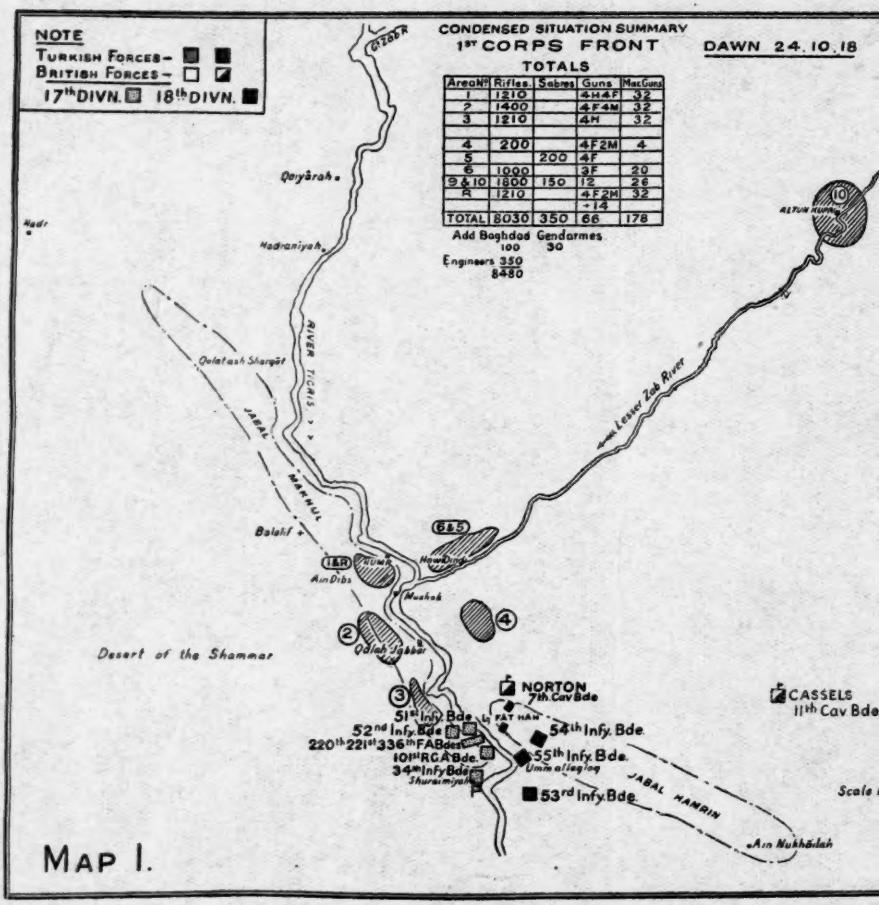
The 53rd Brigade were in reserve about seven miles downstream from Futtah.

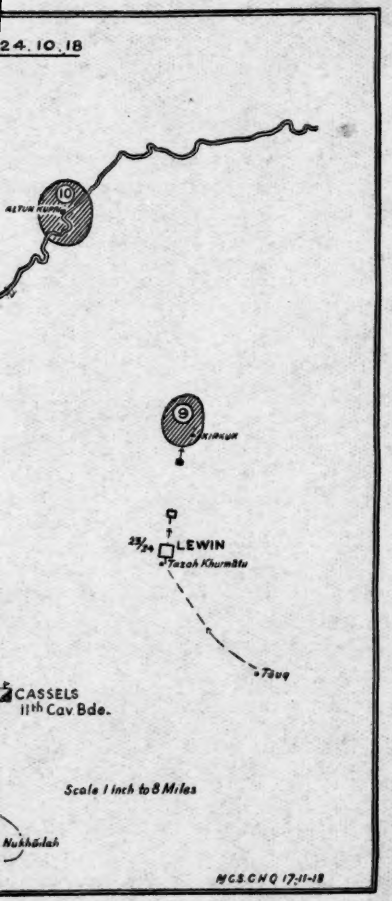
The only troops actually holding the Turkish position on the left bank were the assault company of the 14th Turkish Division with six guns. And the only other troops near at hand on either bank were the 7th regiment with eight guns near Ain Dibs and Bellalij, and the 22nd and Auji regiments near Humr.

The 7th Cavalry Brigade was across the Jebel, about eight miles S.E. of the Futtah position.

11th Cavalry Brigade was at Ain Nakhaila.

It must be remembered that Turkish battalions were weak in numbers though not in arms or equipment. Three battalions formed a regiment, and a regiment usually averaged 1,200 rifles. Our units were also greatly under strength. Each Infantry Brigade had, some months earlier, despatched a battalion as reinforcement to Salonika, and during the operations nearly 2,000 men infected with influenza were admitted to hospital. The 34th Brigade, indeed, had lost many men from this cause before moving, and the Royal West Kent Regiment had now only about 400 rifles, the 112th Infantry, with three companies only, numbered 450, and the 114th Mahrattas were under 800; signallers and transport drivers had suffered from influenza in even higher proportion, consequently the tasks became all the heavier on the remainder. And what was true in the 34th Brigade was true throughout the Corps.


NOTE
TURKISH FORCES-
BRITISH FORCES-
17th DIVN.
18th DIVN.
CONDENSED SITUATION SUMMARY
1st CORPS FRONT
DAWN 24.10.18
TOTALS
Area No | Rifles | Sabres | Guns | MacGuns
1 | 1210 | | 4H4F | 32
2 | 1400 | | 4F4M | 32
3 | 1210 | | 4M | 32
4 | 200 | | 4F2M | 4
5 | | 200 | 4F | |
6 | 1000 | | 3F | 20
9&10 | 1800 | 150 | 12 | 26
R | 1210 | | 4F2M | 32
| | | +14 |
TOTAL | 8030 | 350 | 66 | 178
Add Baghdad Gendarmes 100 30
Engineers 350
8480
Qaryârah
Hadraniyah
Hadr
RIVER TIGRIS
Qalatash Shargât
JABAL MAKHUL
Balalif
Lesser Zab River
ALTUN KUPRI
Ain Dibs
Mushak
Qalah Jabbar
Desert of the Shammar
NORTON
7th Cav Bde
CASSELS
11th Cav Bde
FAT HAN
51st Infy. Bde
52nd Infy. Bde
220th 221st 336th FA Bdes
101st R.G.A. Bde
34th Infy. Bde
Shuraimiyah
54th Infy. Bde
55th Infy. Bde
Umm al Iegiog
53rd Infy. Bde
JABAL HAMRIN
Ain Nukhailah
Scale
MAP I.


24.10.18
10
9
LEWIN
Tazah Khurmâtu
Tauq
CASSELS
11th Cav Bde.
Scale 1 inch to 8 Miles
Nukhailah
M.G.S. G.H.Q. 17-11-18

It is not always realized how weak a cavalry brigade is in numbers, and yet how strong it is to achieve fire effect. The 7th and 11th Cavalry Brigades each numbered about 1,200 sabres, which implies for dismounted action not more than 650 rifles. But each brigade had in addition 48 Hotchkiss guns, 12 Vickers, and a horse battery of six 18-pounders. Behind the power of shock tactics, a cavalry brigade possesses a great reserve of fire strength.

Stated briefly, the Turk had about 3,000 rifles and 30 guns near Futtah, 3,000 rifles and 14 guns near Humr and on the Zab; and these might be reinforced by two or three thousand rifles and 15 guns from the Kirkuk area, and by one or two thousand rifles from Mosul.

Against the 2,500 Turks holding Futtah on the right bank, we had two infantry brigades, each with 2,500 rifles, and the 34th Brigade in reserve with 2,000 rifles. On both banks we had over 100 guns, to which the Turk could only oppose about 30.

It is interesting to note that, of the 13,000 soldiers of the 17th Division, the infantry numbered 7,700, artillery 3,000, administrative troops and sappers 4,000.

The Corps Commander hoped to turn the Turk out of this position by manœuvre, but all preparations for an attack were made, in case the advance of the 18th Division up the left bank should fail to move the enemy.

It was determined to attack the left bank Futtah position at dawn on the 24th.

In view of this, our artillery on both banks registered the enemy trenches during the 23rd. At dusk the 51st and 52nd Brigades advanced on the right bank to within 1,500 yards of the enemy position and dug in. The 51st Brigade stood on a front of about 1,000 yards, with its right resting on the river, and ready to attack if the success of the 18th Division justified such action. The 52nd Brigade were on a 2,000 yards front on the left of the 51st Brigade, but the Turkish right extended some 2,000 yards still further to the west before it was thrown back on to the higher ridges of the Jebel Hamrin.

It was a position of great strength. The ground near the river was very open, the trenches were at once well concealed, arranged in great depth, and so well sited that the whole area was fire-swept, except for some shallow nalas, and the exits of these had been wired. It was, tactically considered, a position that any soldier would rather hold than attack. For more than a year the Turks had been diligently preparing the defence of the Gorge, and now the decisive moment had come and—no soldier was asked either to defend it or attack it.

For, on the night of the 23rd, before a blow had been struck, the enemy evacuated the whole Futtah position.

The 7th Cavalry Brigade had moved round the enemy left flank north of the Jebel Hamrin, and reached Futtah at dawn on the 24th, and throughout the 23rd the enemy must have seen the 54th Brigade column creeping along the crest of the Jebel Hamrin, with the obvious intention of attacking and turning their left flank.

This and the registering of our guns was enough. Ismail Hakki Bey, the Turkish Commander, remembered that he who fights and runs away, lives to fight another day, and fearing that if his left flank were driven back, the retreat of his main force on the right bank would be jeopardised, gave orders so that before dawn his forces had all softly and silently vanished away.

Patrols were rapidly pushed through the trenches and made their way to the crest of the hills, but the enemy had made good his escape.

Ismail Hakki Bey is generally considered to have done right in withdrawing, and certainly the movement was very skilfully carried out. But it did not save his force from eventual destruction and, had he given battle where he stood, the assaulting brigades would have suffered very severe losses. The foresight of our Corps Commander was justified, and his first object achieved. The enemy had been manœuvred out of a very strong position, and was now compelled to fight on ground more favourable to the attack.[1]

During the 24th a general advance was made. General Lewin's column of the IIIrd Corps occupied Kirkuk, and thus secured our right flank. The 53rd Brigade on the left bank, and the 51st Brigade on the right, moved through the Gorge and halted for the night some seven miles upstream.

The Turk had retired to a position, strongly entrenched in places, some seven miles north of the 51st Brigade. This position stretched from Mushaq on the Tigris across the hills to Ain Dibs, on a front of four miles, with the right flank so thrown back along the crest line from Ain Dibs for nearly eight miles to Belalij, as to render it secure against almost any attack from the desert side.

The 34th Brigade marched from Shuramiyah and encamped just south of the Futtah guard house. The 52nd Brigade remained in position and, owing to shortage of transport, were unfortunately not able to move forward with the rest of the 17th Division.

On our left flank a column of 12 armoured cars moved to Hadr, an old city far out in the desert, some 90 miles from Tekrit and about 30 miles north-west of Sharqat. With them went 55 Ford vans, carrying water, petrol and supplies, so that the 12 L.A.M. cars were able to act independently for several days against the enemy line of communications north of Sharqat, and thanks to the energy and boldness of their leaders, this column proved itself a most valuable addition to our force.

The 11th Cavalry Brigade, under General Cassels, left Ain Nakhailah at dawn on the 24th and, after a march of 45 miles through the country

[1] Hakki Bey is a man of great intelligence. I had several conversations with him this Spring in Amara where he was a prisoner. As regards the evacuation of Futtah, he told me that, in his opinion, as he had not sufficient troops to prevent our 18th Division advancing up the Tigris left bank, he wished to withdraw earlier, but was not allowed to do so by orders he received from headquarters. But had he had, on the 24th, the 12,000 men who reached him by the 30th, I gather Hakki Bey would have held on to Futtah, counting that our losses would have been so heavy as to prevent any pursuit.

of the Jubur Arab, reached Uthmaniyah, on the Lesser Zeb, some 20 miles above its confluence with the Tigris.

At first no enemy was visible, and after the advance guard had nearly reached the ford, an aeroplane landed on the left bank and was at once rendered useless by machine gun and rifle fire from the right bank. By one of these extraordinary chances of war which sometimes alter the fate of a whole campaign, a Turkish detachment of 800 rifles and 200 sabres and 4 guns was marching down the right bank of the Lesser Zab, to reinforce the VIth Army, and reached Uthmaniyah on the right bank about the same time. A brisk fight ensued, but happily the Turkish detachment was unable to check the 7th Hussars, who led the brigade, and, supported by the fire of W Battery, the crossing was effected at dusk with the loss of a few men drowned.

The roads on either bank of the Tigris through the Futtah Gorge were now available to our columns, but they were less like highways than switchbacks climbing up and down the dry water courses that run in deep gullies across the road from the hills to the river. War diaries of different units do not always agree in the telling of the same tale. But on this occasion the diaries of both the 17th and 18th Divisions are in strict agreement. "The road," each says, " on this bank is the worst in Mesopotamia."

The 17th Division from this point was obliged to leave all wheeled transport behind. By converting the transport mules into pack, enough supplies were forwarded for the two brigades; but it was only by extraordinary efforts that any guns were brought through the Gorge.

By the evening of the 25th, the 51st Brigade had nearly reached Mushaq on the Tigris, their left flank being protected by a detached column, under Colonel Coningham, who worked along the crest of the Jebel Hamrin towards Ain Dibs. The 34th Brigade moved along the road some miles in the rear of the 51st, and encamped for the night on the river near Qalah Jubah.

The Highland Light Infantry, who formed the advanced guard of the 51st Brigade, encountered the enemy after dark as they were advancing along the road to Mushak. It was believed that the Turks were in full retreat, but such was by no means the case. The Turk had not evacuated his strong position, which stretched over the broken hills of the Jebel Hamrin, across the main road to the Tigris. The road here lies close under the foothills, and is a few hundred yards from the river bank. The river is dry at this point, and the scrub extends for another three hundred yards where the main channel is reached. Across the channel, on the far bank, a wreck lies stranded. It is the " Julna," the steamer that had, in 1916, made her last brave adventure in the gallant but hopeless endeavour to bring food to the starving garrison of Kut.

From the foot of the hills, over the flat alluvial plain to the river bank, the enemy had dug a traversed trench behind a low wire entanglement. This position he still held, and the Highland Light Infantry lost heavily in attacking it. Some rushed to the gap in the wire by which

the road passed, others on the right, hacked a roadway for themselves with their entrenching tools and, in spite of the heavy fire from the hills on their left, the leading companies, in a style worthy of the traditions of the regiment, gallantly gained the enemy's trench and dug themselves in and held their ground in front of it throughout the night. But it was obvious that any further advance that night was impossible, and the rest of the brigade halted about a mile in rear.

I said that the 53rd Infantry Brigade was advancing along the left bank and that the 7th Cavalry Brigade had reached Futtah on the 24th. These two brigades on the 25th forced the crossing of the Lesser Zab, near its confluence with the Tigris, in the face of heavy shell fire. For some reason, perhaps with the idea of preventing this, the enemy crossed his reserves from the left bank to the right bank.

On the 25th the 53rd Infantry Brigade had advanced along the left bank, and the 7th Cavalry Brigade were a few miles north of Futtah on that evening. These two brigades on the 25th forced the crossing of the Lesser Zab, near its confluence with the Tigris, under shell fire. For some reason, perhaps with the idea of preventing this, the enemy crossed his reserves over from the right bank to the left bank of the Tigris.

There they were heavily bombed by No. 63 Squadron R.A.F. and, late in the afternoon, the force was withdrawn again to the right bank. These reserves might have been effectively employed on one bank or the other; as it was, the force was perfectly useless. Its action offers one more example of the fatal results of indecision, of orders followed by counter orders. Any plan is better than no plan. "De toutes les fautes une seule est infamante, l'inaction."

Hitherto there had been no doubt as to the best line of advance of the 17th Division, but now the Ain Dibs road, on the crest of the Jebel, stretched further from the Mosul road, and it had to be decided whether it were best, on the 26th, to continue the attack begun by the Highland Light Infantry, or whether to reinforce Coningham's column, and force the enemy off the high ground, before attempting a further direct advance along the Mosul road.

Difficulties of transport for watering, and for arranging an effective artillery support to a column operating on the Jebel were great, and a little after dawn, General Hildyard received orders to renew the attack with the 51st Brigade.

By extraordinary exertions and skill, reflecting the highest credit on the gun teams, the leading batteries of the 17th Division were achieving the apparently impossible task of bringing the guns and a limited number of rounds through the Gorge, and the attack of the 51st Brigade was supported by one battery of 4.5 howitzers in action on the low ground near the river, and one mountain battery on the slopes of the hills.

But the Turks had every advantage of positions well concealed among the hills, and also of command; two sections of our howitzers were put out of action, and the infantry came under a very well directed shrapnel fire.

In spite of heavy losses the two infantry battalions were unable to gain much ground, and the Turk even threatened to push back part of the Sikhs who, advancing through the high scrub towards the river, had come under a hot enfilade fire from the enemy machine guns hidden among the ridges and nalas of the lower hills.

It was soon realised that we were not attacking a weak rear guard, but an enemy holding a position of great strength, and the 34th Brigade was ordered to move forward and support the 51st Brigade. Before continuing the account of the action it is necessary to consider the manner in which the enemy were defending the position.

The low ground down to the river, over which the 14th Sikhs had advanced, is covered with high scrub. Across this at its narrow and northern end, the Turks had dug a line of trenches, over 200 yards long, strengthened by wire entanglements from the Mosul road to the Tigris channel. This first channel is almost dry, and on its further bank there exists the so-called island, also covered with scrub, which stretches eastward to the main water channel, beyond which the " Julna " lay stranded. Consequently there was nothing to prevent the Turk from pushing skirmishers across the island on to the low ground between the foot hills and the Tigris, and these, from amongst the scrub, would have taken the Highlanders in reverse. A few Turks were detected advancing for this purpose, and reports were brought in asking for assistance, as parties of the Sikhs on the right flank were being cut off. Two companies of the 114th Mahrattas were therefore immediately sent to support the Sikhs on the right. These two companies advanced in most soldierly fashion under heavy shell fire, and established themselves between the right of the Highlanders and the river. The ground they gained they held all day under a most galling fire, and the Turk made no further effort to advance through the scrub.

The 112th Infantry, skilfully led by their officers, advancing among the precipitous crags and gullies, secured the hills on the left of the Highland Light Infantry, and later, gained touch with the right of Coningham's column.

At first glance it seemed that the enemy position could be turned by our troops capturing the higher hills towards Ain Dibs, immediately east of it. But the position was well chosen. Just north of the high hill, in front of the Highland Light Infantry, a very deep precipitous nala runs from north-west to south-east, and one company 112th Infantry, who occupied the ridge that bounds the south-eastern section of this nala, was unable to make any further advance in this direction. To cross this nala it was necessary to move higher up (i.e., north-west) and here, where the left centre of the 112th Infantry were (about midday) an advance might have been made by the 112th Infantry acting in touch with the right of Coningham's column. This would have turned the flank of the enemy's position opposite the Highland Light Infantry, or to put it more correctly, would have penetrated the enemy's line, which he held in front of Ain Dibs, eastwards to the Tigris. It is obvious that had the penetration of the centre of his line been effected,

both flanks would have been compelled to retire. But the difficulties to effect this penetration were very great. The troops of the 51st Brigade were temporarily exhausted by marching and fighting, and had suffered heavily. The ground required careful reconnaissance, and even then the advance would be slow, and positions, even for mountain batteries, hard to secure. Consequently the Divisional Commander, after making a personal reconnaissance, wisely decided to refrain from attempting any further advance till the next morning.

During the day, three more batteries had managed to make their way through the Gorge, and in the evening the Royal West Kent Regiment, who had been left behind to assist the artillery moving up the Gorge, rejoined the 34th Brigade.

The 114th Mahrattas relieved the Sikhs, and the troops held their positions throughout the night, facing the Turks.

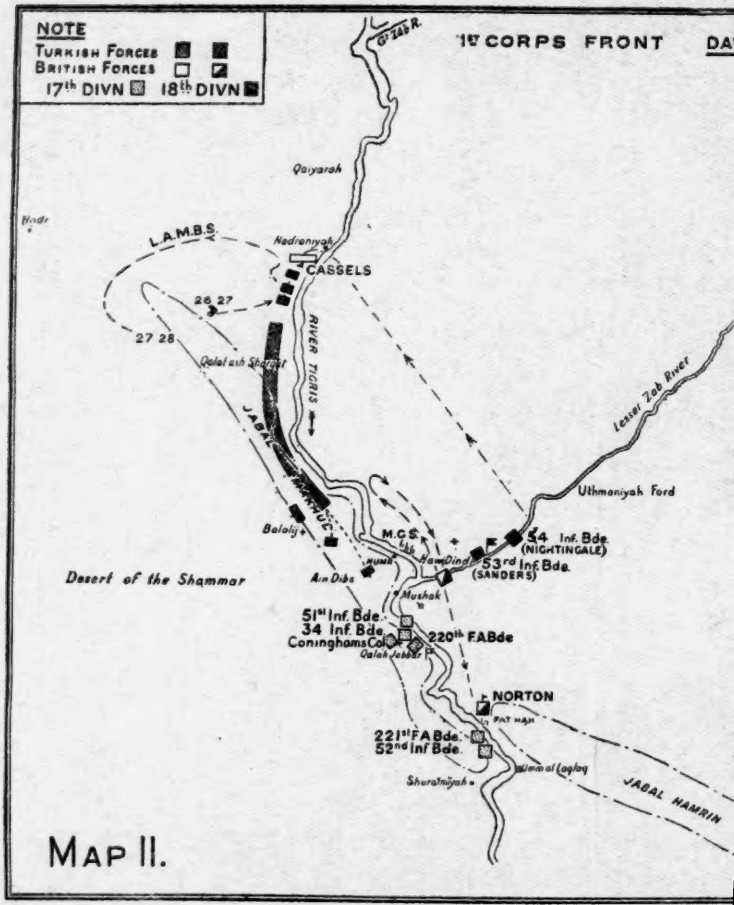
While this fighting was in progress, General Lewin, commanding the 1st Corps Column, had occupied Kirkuk, with the object of engaging the enemy's attention and so preventing him sending reinforcements from that neighbourhood to our opponents on the Tigris.

General Cassels' Brigade had secured the passage of the Zab, near Uthmaniyah, by the night of the 24th (see Map II.) This Brigade moved at 6.30 a.m. on the 26th in a north westerly direction, with the object of crossing the Tigris north of Sharqat, and so cut the only line of retreat open to the enemy. It was a manœuvre very bold in conception and very boldly carried out With the help of an Arab from a small village a place of crossing was found, a ford nearly five feet deep and the current rapid. But such obstacles did not deter Cassels' Brigade. No enemy was there to oppose the crossing; by 4.0 the Guides Cavalry were on the right bank, and an hour later had seized a strong position immediately north of the Hawaish nala, some 4 miles above Sharqat, and right across the main road to Mosul.

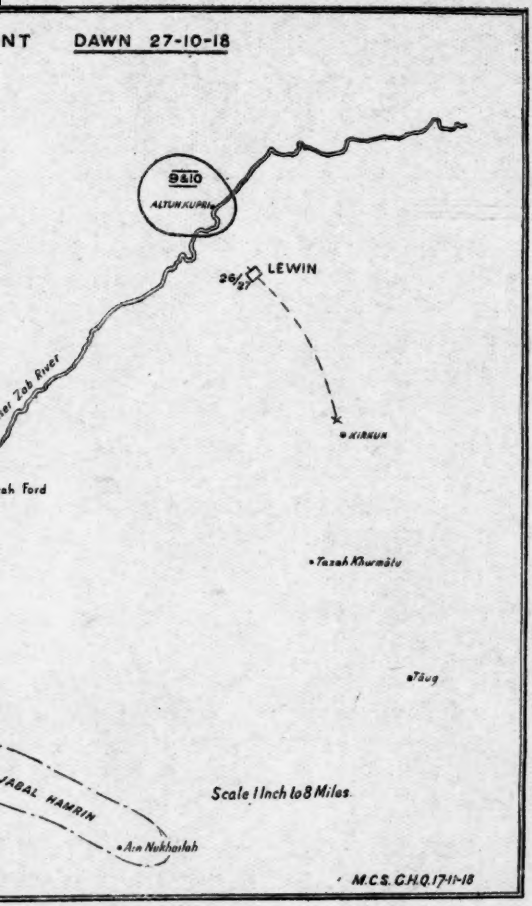
Though General Cassels had thus cut the only line of retreat open to the enemy, the Brigade was altogether in the air, with the bulk of the Turkish Army between their position and our main forces. It was a great adventure, but well handled, it led to great results, for the measure of its success was the attainment of our true objective, the complete destruction of the VIth Turkish Army.

It had been intended to support General Cassels' Brigade by moving the 7th Cavalry Brigade up the left bank. This Brigade, under General Norton, had forced a crossing of the Lesser Zab on the 25th, and captured over a hundred prisoners on the north bank. On the 26th, patrols were sent up-stream towards Sharqat, partly in order to prevent the Turks crossing from the right bank of the Tigris, partly in order to screen General Cassels movement. This achieved, the Brigade was ordered back to Futtah Gorge to replenish and re-fill, and there it halted till the morning of the 28th.

General Cassels situation on the morning of the 27th was not enviable. To some commanders an immediate retirement might have seemed to be the right course. He knew the bulk of the enemy were


NOTE
TURKISH FORCES
BRITISH FORCES
17th DIVN
18th DIVN
15th CORPS FRONT
Great Zab R.
Qaiyarah
Hindr
L.A.M.B.S.
Nedrenyah
CASSELS
26 27
27 28
Qalat ash Sharqat
RIVER TIGRIS
JABAL MAKHUL
Lesser Zab River
Uthmaniyah Ford
Balaij
M.G.S.
54 Inf. Bde. (NIGHTINGALE)
53rd Inf. Bde. (SANDERS)
Desert of the Shammar
Ain Dibs
Mushak
51st Inf. Bde.
34 Inf. Bde.
Coningham's Col.
220th F.A.Bde
NORTON
221st F.A.Bde.
52nd Inf. Bde.
Shuraiyah
JABAL HAMRIN

MAP II.


NT DAWN 27-10-18
9&10
ALTUN KUPRI
LEWIN
26/27
Zab River
KIRKUK
ah Ford
Tazah Khurmatu
Tuz
JABAL HAMRIN
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Scale 1 Inch to 8 Miles.
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on the right bank, between his force and the 17th Division, who were still south of Humr. Reconnaissance had showed that at least a thousand Turks were in position some three miles south of Huwaish, and that another column of unknown strength was moving in his direction from the north. But a retirement was the last thing ever thought of by General Cassels. Only by maintaining his column across the enemy line of retreat could the Corps Commander's plan be achieved. "Briser la volonté de l'ennemi, tel est donc le premier principe que nous indique l'étude ; la briser par un coup inattendu d'une vigueur suprême, telle est la première consequence de ce principe."

He determined to conceal his weakness by bold action. A squadron of 7th Hussars were sent to hold up the enemy to the north. W. Battery came into action near Huwaish ruins, and under cover of their well directed fire, the 23rd Cavalry attacked the enemy in position south of the nala.

In this attack the L.A.M. cars from Hadr covered the right flank of the cavalry. One car was unfortunately struck by a direct hit at close range, and the commander and team made prisoners.

After the attack had forced the enemy to reveal his exact position, and disclose at least one battery, the cavalry were withdrawn, but the bold stroke had its reward.

After the surrender on the 30th, the Turkish Commander confessed he had not attacked Cassels' column on the 27th, because he judged from Cassels attacking him that there were at least two Cavalry Brigades north of Huwaish. Never was the maxim better exemplified. "De l'audace et toujours de l'audace."

Every tactical consideration demanded that the enemy should destroy Cassels' column ; the 27th gave the Turk his best opportunity. By the boldness of his stroke, General Cassels not only helped the operations as a whole, but secured the safety of his own column. For the Corps Commander was fully aware of the situation, and reinforcements were, with all speed, being sent forward.

Before returning to the 34th Brigade, near Mushak, it is well to recall the general situation as it stood on the evening of the 26th.

On the evening of the 26th, the 34th and 51st Infantry Brigades were facing the enemy near Mushaq, with Coningham's column, on the crest of the Jebel some four miles south of Ain Dibs, and moving to support Coningham, the 45th Sikhs and a machine gun company were marching up from Futtah ; the remainder of the 52nd Brigade were still south of the Gorge. In support of these troops we had 30 field guns and howitzers and 12 mountain guns, and south of the Gorge were six more batteries (see Map II.)

Opposed to these troops, the enemy had the 43rd and 9th Regiments and 250 sabres north of Mushaq near Humr ; the 22nd Regiment opposite Coningham's at Ain Dibs, and the 7th Regiment at Balalij. With these troops the enemy had 32 guns.

Twenty-five miles north of Humr, General Cassels was holding the Huwaish nala with the 11th Cavalry Brigade ; opposed to him were

three or four battalions of Turks and about 12 guns in position south of Huwaish, while the 13th Turkish Regiment and two guns were approaching him from Mosul.

The L.A.M. Brigade were based on a depot that had been formed near Hadr, some 30 miles west of Huwaish.

There were now no Turks on the left bank, and the leading two infantry brigades of the 18th Division were across the Zab; the 53rd Brigade, with two batteries, being under orders to push up on the 27th to assist General Cassels at Huwaish.

With the 18th Division were 36 guns.

General Norton's 7th Cavalry Brigade was also north of the Lesser Zab, but this Brigade was ordered back to Futtah the following morning.

We left the 34th and 51st Infantry Brigades facing the Turk in position near Mushaq, on the night of the 26th. Vigorous patrolling was maintained throughout the night, and before dawn it was discovered that the enemy was retiring. Our patrols pressed on after the retreating enemy, the 114th Mahrattas forming the advanced guard, while the 112th Infantry cleared the high ground, and so protected the left flank during the advance.

These two battalions reached the hills bounding the Humr plain before 8 a.m., but a delay of several hours then occurred, spent in collecting the various units of a new column, known as Wauchope's column, that was now being formed. It consisted of one squadron 32nd Lancers, 220th Field Artillery Brigade, 25th Mountain Battery, 34th Infantry Brigade, two companies of Sappers and Miners, and the advanced portion of the 35th Combined Field Ambulance.

It was mid-day before the column was complete and animals watered. The advance was then continued to Qalat al Bint; the 112th Infantry, as left flank guard, followed a track over broken ground, the remainder crossed the Humr Plain, passed the site of the Turks pontoon bridge, now broken, and, after a winding march of about 15 miles, reached Qalat al Bint just after sundown, and there went into bivouac. The road seemed almost impassable for wheeled traffic and it was close on midnight before the howitzers reached camp, and the horses had to march the next day without watering. Except for a number of broken pontoons taken from the bridge at Humr, and a dump of ammunition in the same place, there were few traces of disorder, and the enemy had left few arms or equipment behind him.

Not for the first time in Mesopotamia had the Turk fought a successful rear guard action and then, under cover of night, effected a masterly retirement. In this case his success was of a very temporary nature, and was mainly due to the natural strength of the position he had defended. In selecting a position to suit his requirements the Turk is a master. Nothing dismays the Turk so much as a threat on his flank, and it was with extraordinary skill, both in 1917 and 1918, that he selected positions whose flanks were secured by nature against any ordinary attack. By digging trenches with a very low profile, and by siting them in great depth and at wide intervals, he not only gained

a certain measure of invisibility, but also rendered it a matter of extraordinary difficulty for our artillery, and even for the attacking infantry, to distinguish between advanced trenches and the main position.

Reports from aeroplanes now showed that the enemy had taken up an entrenched position covering Sharqat, some 15 miles north of Qalat al Bint, with a force of several thousand rifles and eighteen guns. This position was of special importance because the Desert road, which ran parallel to, and to the west of the Jabal Makhul, here swings towards the Tigris and joins the river road along which we had advanced. As soon as we could capture this road junction, we should no longer be obliged to rely on pack transport only, but both wheeled transport and heavy guns would then be free to move up the Desert road.

The troops had had hard work and little rest for 48 hours, but in a pursuit time is an all-important factor. The situation of Cassels' Brigade demanded there should be no pause in our advance, so, after a meal and a few hours' rest, the column moved off at 3 a.m. on the 28th, with the intention of attacking with the least possible delay. The Royal West Kent Regiment formed the advance guard and searched the heights on either side of the road, where parties of the enemy had been seen the evening before. This made the advance of the column very slow in the dark, and the artillery had great difficulty in crossing the deep nalas that intersected the road.

The enemy were reported to be holding a strong position some 15 miles north-west of Al Bint. When the column had advanced about seven miles, the 112th Infantry and 25th Mountain Battery were ordered to proceed to the top of Jebel and advance along and attack and drive in the enemy's left flank ; also to get in communication with 18th Division on left bank of river, at the same time keeping helio communication with 2nd Battalion Royal West Kent Regiment during their advance along the foothills.

The night before it had been suggested that a halt of two hours should be made at this point in advance to allow the 112th Infantry and 25th Mountain Battery to gain the crest of the Jebel Hamrin and thus to make their advance parallel with the main column, and eventually synchronise their attack on the enemy's left with that of the main column. But as Cassels' column, now on the right bank of the Tigris, was being heavily attacked by the Turks, time was an all-important factor, and the column was ordered to get into action with the least possible delay. The 2nd Battalion Royal West Kent Regiment therefore continued to lead the advance of the main column, while the 112th Infantry on the right flank came along some two miles in rear.

An hour later communication was established with Coningham's column. This column, after some stiff fighting near Ain Dibs, was now moving with all speed along the very difficult track that runs along the western branch of the Jebel Hamrin with the intention of striking in on the enemy's right in the coming action.

An aeroplane dropped a message giving the correct position of enemy trenches and estimating number of enemy at 2,000. This information was most valuable, as was the work of reconnaissance carried out by the squadron of 32nd Lancers. The latter pushed forward till they came under heavy machine gun fire, and throughout the morning the Commander kept me informed of the enemy's movements and the easiest ground over which to advance.

Both columns were ordered to push on but not to attack until they received effective artillery support. Deep nalas stretching across the plain were found impassable even for pack animals. Consequently the advance of the West Kent Regiment was considerably delayed, as more than once they had to close all Lewis gun mules in order to cross the nalas at places where they found a practicable way. Only highly trained troops could have maintained the right intervals and distances during such an advance, and it was due to this that later they met with comparatively few losses when coming under shell fire. The same is true to a marked degree of the two sections 129th Machine Gun Company, who advanced on either flank of the West Kent Regiment. Several orders were given to move forward with all possible speed, but the deep nalas interfered with the progress of the batteries even more than with that of the infantry, and it was with great difficulty that one howitzer battery and an 18-pounder battery came into action in rear of the West Kent Regiment. No aeroplane was available for work with the artillery, and the Turkish trenches were, as usual, very well sited and observation proved difficult.

Communication was maintained by helio with the column on the right flank, but the leading company of the 112th Infantry was still some two miles in rear when the West Kents engaged the enemy; the 25th Mountain Battery was unable to find gun positions within range, and this column only reached the plain, south of Ashur, after the Turkish position had been captured.

Coningham's column, on the left flank, were also seen issuing from the hills from the direction of Belalij, and were within distant artillery range at the time of attack. The enemy were well aware of these two columns threatening their flanks and had the attack been delayed at this juncture, in order to give time to allow the two flank columns to co-operate, it is probable that the enemy would have withdrawn without fighting, since there is nothing the Turk so much dreads as having his retreat threatened.

The enemy's position was about two miles in length, stretching from the cliff edge westward to the Mosul road, with his right refused to the north-west. It had been reported by aeroplane that the position was held by over 2,000 rifles, but later on nearly half of these were withdrawn and the position, at the time of attack, was held by one regiment only.

About mid-day definite orders were given for an attack to be made against that part of the enemy's line that ran from the cliff edge westwards to the Sharqat road, a distance of over twelve hundred yards. The attack

to be made by the West Kent Regiment, two sections of the 129th Machine Gun Company, with one company 114th Mahrattas in support. On the right the 112th Infantry and the mountain battery were still a mile or two in rear, consequently the brigade reserve was reduced to Headquarters and three companies 114th Mahrattas and the two sections remaining of the machine gun company. By taking advantage of the many nalas these were kept in close support of the attacking troops, thus allowing the attack to be delivered on a wider front than otherwise.

The attack was brilliantly carried out and the enemy's first line taken without a pause and without rifle fire. The second line was some eight hundred yards in rear of the first, and against this the five companies now advanced in perfect order, though necessarily with wide intervals and distances between them. Each flank of the enemy's second line was defended by a strong redoubt. That on the right, near the cliff edge, was rushed and captured with sixty prisoners and four machine guns. The broken ground to its front gave opportunity to the attackers, but the strong point on the open ground to the left was more difficult to assault. The two batteries in rear did all that was possible to support the attack, but difficulties of observation were great. One section of the machine gun company, however, had pushed well forward on the left flank in advance of the infantry, and by 1.20 p.m. was able to bring an effective flank fire on the enemy's strong point. Under cover of this the West Kents advanced within a few hundred yards to the south-east of the strong point and brought a heavy rifle and Lewis gun fire at short range against the redoubt. This enabled two platoons to make their way to the west rear of the redoubt, which was rushed a little before 2 p.m. by the whole company and captured with a hundred prisoners and six machine guns.

The line had now necessarily been drawn out to nearly sixteen hundred yards, with a large gap in the centre. To fill this, and to confirm the success, the three companies 114th Mahrattas were ordered to push forward on the high ground to the right and centre of the attack. This was at once carried out, two more Turkish machine guns being captured and the enemy forced back beyond Sharqat.

I have laid special stress on the minor tactics of this action partly because I was in a position to observe it, partly because I consider it an example of how excellent local leadership can bring about a rapid and complete success. The West Kent Regiment, it is true, lost 25 per cent. of their number, but had any mistake been made, had control been lost at any time over those very widely extended platoons, had full use not been made of all covering fire available, had the men ever failed to respond to their leaders or to think of their own safety, then had their losses been doubled and the issue hung in balance.

The tactics of the machine gun company were also successful. One section, by moving off in advance of the attacking companies, was able to bring effective fire from a flank at the moment of assault. Each section moved in extended formation covered by a party of sixteen scouts trained for this purpose, and, though many shells burst near the guns, by using

the ground their losses were few. One section opened fire at a range of 2,200 yards and fired over the heads of the advancing infantry until the latter were within five hundred yards of the enemy's first position. It is also of interest to note that, towards the end of the action, some machine guns kept up a fire on the enemy's line of retreat, and so helped to secure the surrender of the 200 prisoners.

The troops bivouacked on the ground won within two miles of the Tigris, and with the opening of the desert road the supply question became easier. It is a severe task, and happily one that is not often set, suddenly to supply a division by converting wheeled transport into pack ; all credit to those who achieved it.

The wounded were well looked after, both in the regimental aid posts and in the advanced dressing station of the 35th Combined Field Ambulance. There was no shortage of dressings or equipment, but water was a great difficulty. Happily the medical officer discovered a spring, the only one, except for some stagnant water, between Qalat al Bint and Sharqat, and close beside this he opened the dressing station. The wounded had now no longer to be evacuated by the road by which we had come. The arrival of Coningham's column from Belalij had opened the main desert road, and by this route wounded were now passed down in ambulances, and heavy guns were sent forward from Futtah.

Leaving the infantry to bivouac for the night (28th-29th) within sight of the ruins of Ashur, we must now turn to follow the fortunes of Cassels' column, astride the Mosul road beyond Huwaish. He had, on the night of the 27th, no other forces than the 11th Cavalry Brigade, and the L.A.M. cars, based on Hadr.

A column, however, under General Sanders, consisting of the 53rd Infantry Brigade, one field battery, one section 60 pounders, and one section 4.5 howitzers, had moved from the Lesser Zab at 9 a.m. on the 27th, and after a march of 33 miles, the leading battalion, the 10th Gurkhas, reached the ferry above Huwaish before dawn, and had joined Cassels' column by mid-day on the 28th. The guns and remainder halted some miles south of Huwaish, near the Tigris on the left bank.

On the opposite bank, facing Cassels' column, were some 2,500 Turks with 12 to 24 guns.

The night of the 27th passed quietly, but in the early morning of the 28th the enemy advanced in force with his right on the river bank, less than two miles south of General Cassels' position, but their further advance over the open was kept in check by the accurate fire of W battery, the high ground near the Huwaish ruins affording excellent observation. General Sanders sent forward to the ferry his ammunition column, bringing a much needed supply of 18 pounder shells, and his guns got into action on the low ground on the left bank opposite Huwaish. At this time General Cassels estimated that there were 24 guns firing against his position, and at 8 a.m. he asked General Sanders to engage them. General Sanders replied he was all ready to knock out the enemy guns as soon as they opened fire, a somewhat unexpected answer to a

commander who had been under a rather severe fire since dawn. It shows how difficult observation may be in this country, and what invaluable service can be given by aeroplanes working with artillery. As it was, General Sanders' guns had no better target to range on than the bursts of W battery, and the enemy's losses were probably not very severe.

General Cassels now determined to make a counter stroke against the enemy's left flank, and to that end ordered the 7th Hussars to move up the dry bed of the main Wadi, a branch of which might allow the regiment to arrive unseen within striking distance of the enemy's flank. This movement was skilfully executed, and the attack ably carried out by the 7th Hussars. Indeed, it was executed with almost too much dash—if such be possible in an attack by cavalry—for one squadron suddenly found themselves facing some enemy guns at point blank range of 200 yards. Throughout the operations the enemy's artillery was generally well directed, but the sudden appearance of a squadron of 7th Hussars, all ready to charge, is apt to shake the aim, if not the nerve, of the staunchest master gunner. The 7th Hussars, with little loss to themselves, drove the enemy's flank far back, and rejoined after carrying out their task with conspicuous success.

Later in the day, large enemy columns were seen moving northwards, past the right of General Cassels' position. These were stopped by the effective fire of the L.A.M. cars Brigade that co-operated from Hadr.

Up stream, however, affairs were not going so well, and the single squadron watching the enemy's column advancing south was forced back about a mile. Happily at noon the leading company of the 10th Gurkhas arrived and relieved two squadrons of the Guides Cavalry, who at once moved off to reinforce the single squadron of 7th Hussars watching the enemy's northern detachment.

For three days without pause Cassels' column had been marching and fighting. But now all danger of being swept aside by superior numbers was soon to end, by the arrival of fresh troops.

At one a.m. General Norton's Cavalry Brigade left Futtah and had crossed the Zab by eight o'clock. Before dusk they had covered a distance of 45 miles and reached the ford above Huwaish at Hadraniyah.

Knowing the urgent need, tired man on tired horse, they forced their way across the river with a loss of 15 brave men drowned. The swirling waters hardly deserved the title of a ford, and the possibility of crossing here was all unknown to the Turk. Indeed, Ismail Hakki Bey, after his surrender, would hardly believe that Cassels' column had not, in some miraculous way, swept in from the desert like the L.A.M. cars. It was the resolution of the cavalry leaders to carry out undauntedly their task that completed the destruction of the Turkish Army.

As soon as his cavalry were across, General Norton took over the protection of Cassels' right flank, V Battery remaining for the night on the left bank. From the south the Turks maintained a constant rifle fire throughout the night, their guns were also active, but no attack was developed.

Early on the 29th, the leading companies of the 39th Garhwalis, and a little later a field battery, also from General Sanders' column, crossed the river and moved up on the right flank of the 7th Cavalry Brigade, the fire of V Battery from the left bank having previously caused the enemy guns to withdraw, thus allowing a free crossing to V Battery. The task of the 7th Brigade was, however, not only to protect the right flank, but also to block the retreat of any Turks attempting to escape northwards (see Map III).

The 13th Regiment of the 5th Division had marched about 1,000 strong, with two guns, from Mosul intending to attack Cassels' column from the north. This regiment was now drawn up opposite the 7th Brigade, in position on the bluffs that run roughly parallel to the river.

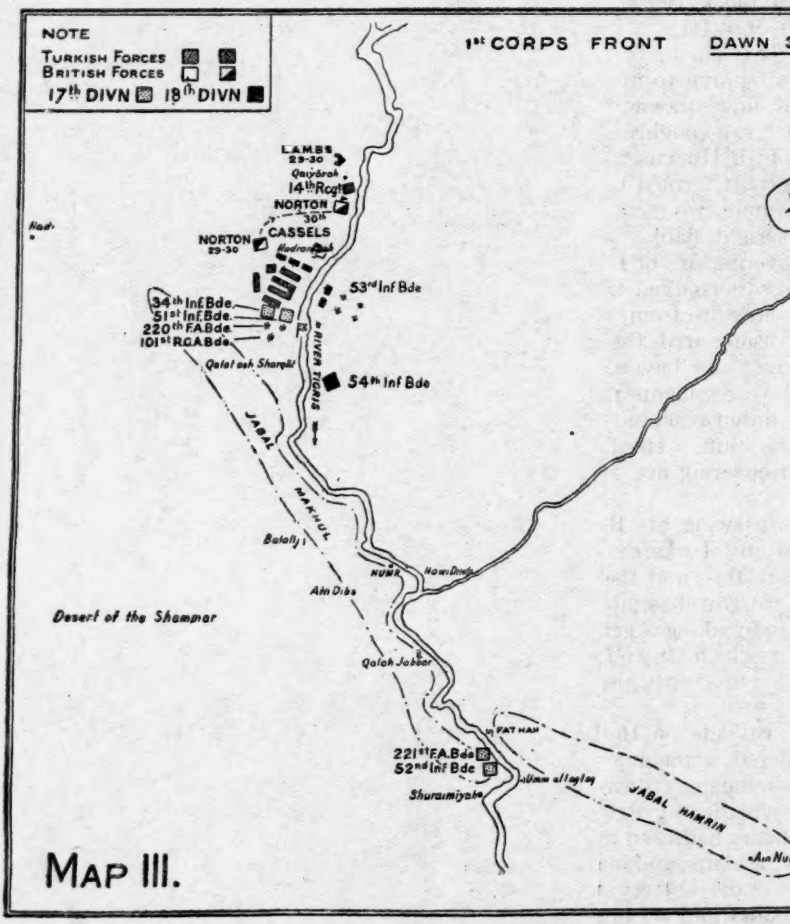
General Norton formed up the 13th Hussars in rear of a low hill, some 1,500 yards from the high bluff that formed the key of the enemy position. At the same time, his remaining two regiments made a turning movement, threatening the enemy's right flank.

At 12.40, under well directed covering fire of the two batteries and machine gun squadrons, the 13th Hussars charged across the open plain, without losing a man, in spite of a heavy fire from rifles and 14 machine guns. At the foot of the bluff they dismounted, then climbing the steep face of the cliff they gained the crest, and bayonetted the few Turks remaining in their trenches. The three regiments pursued together and secured a thousand prisoners and a dozen machine guns, in addition to a hundred dead found on top of the bluff. The splendid dash of the 13th Hussars, aided by the excellent covering fire, secured this complete success with a loss of only 18 men.

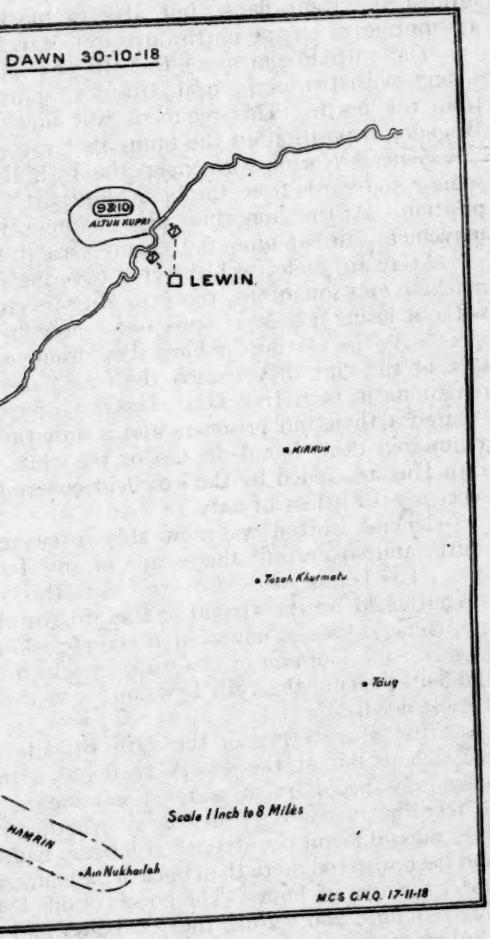
General Norton was now able to swing his Brigade round to the south, and so prevent the escape of any Turks moving wide of Cassels' line. The L.A.M. cars also assisted in this, and the column was further strengthened by the arrival of the 3rd Gurkhas, about five o'clock.

General Cassels now contemplated making a general offensive movement on the morning of the 30th, by which he would fall on the rear of the Turks facing the 17th Division ; but events elsewhere rendered this attack needless.

After the victory of the 34th Brigade on the 28th near Sharqat, the exhaustion of the troops rendered a pursuit impossible. It was absolutely necessary to water the animals, it was equally necessary to rest the men. For three days, whether by fighting, or by climbing over most difficult country, their labours had been incessant ; no animals had been watered more than once in 24 hours, and many had gone without water for over 48 hours. The horses of one battery, indeed, had no water for 60 hours, and during that 60 hours had no grass and little boussa, hard work and little rest. The horses suffered in condition but the battery was again in action on the 29th. The 34th Brigade went into bivouac on the ground won, and were joined before dark by the 51st Brigade and the remainder of the 17th Division. But Cassels' column had been continuously on the march or in action for 72 hours, consequently it was imperative to give the enemy no respite, but to follow him up with


NOTE
TURKISH FORCES
BRITISH FORCES
17th DIVN
18th DIVN
1st CORPS FRONT
DAWN
LAMBS
29-30
Qaiyârah
14th Rcgt
NORTON
30th
CASSELS
NORTON
29-30
Hadrah
53rd Inf Bde
34th Inf Bde.
51st Inf Bde.
220th F.A.Bde.
101st R.G.A.Bde.
Qalat esh Sharqât
RIVER TIGRIS
54th Inf Bde
JABAL MAKHUL
Balalij
NUMR
Hawi Dreij
Ain Dibs
Desert of the Shammar
Qalah Jabbar
FAT HAH
221st F.A.Bde
52nd Inf Bde
Shuraimiyah
JABAL HAMRIN
Ain Nu

MAP III.


DAWN 30-10-18
9210
ALTUN KUPRI
LEWIN
KIRKUK
Tuzah Khurmatu
Tuz
Scale 1 Inch to 8 Miles
HAMRIN
An Nukhaylah
MCS G.H.Q. 17-11-18

the least possible delay. But, tired as were our troops, their fighting and determination had now put the enemy in a very difficult position.

On the evening of the 28th, the 34th and 51st Brigades, including the 45th Sikhs, were in bivouac three miles south of Sharqat. With these were 24 field guns and howitzers and 12 mountain guns, and two squadrons 32nd Lancers.

The 22nd and 43rd Turkish Regiments, with 24 guns, were retiring northwards to join the enemy forces south of Huwaish opposing Cassels. These were the 7th and 9th Regiments, the Auji Regiment, and one battalion of 18th Regiment, with 17 guns, a total of nearly six regiments (7,000 rifles) and 41 guns.

North of Huwaish, General Cassels had the 7th and 11th Cavalry Brigades, including 24 guns, also one battalion of Gurkhas.

The remaining two battalions and guns of Sanders column were still on the left bank nearing Huwaish.

Advancing towards Cassels' column from Mosul were the 13th Regiment near Hadraniyah, and the 14th Regiment at Qaiyarah, some 12 miles further north, with six guns.

The moon rose on the morning of the 29th at half past one, and a quarter of an hour later the 51st Brigade moved from their bivouac. The advance during the night was inevitably very slow, because anywhere in that broken ground the enemy might have hid small parties or groups of machine guns, but by 7.30 a.m. the Highland Light Infantry and 10th Gurkhas were in contact with the enemy some three miles north of Sharqat. The Turkish rear guard did not follow the line of the river, but kept on the higher ground two or three miles to the west of it. Captured officers stated afterwards that the rear guard commander had followed a track in the dark which he thought ran close to the Tigris. Whether by bad luck or by bad guidance, the mistake had the same result, and we were enabled to deny the river to the Turks from Sharqat to Huwaish, consequently his main force south of Huwaish was unable to draw water after the night of the 28th. The force opposed to General Cassels had entirely failed to dislodge his brigade established across their line of retreat, and by this failure the Turk lost his only chance of escape to Mosul. A retirement through the waterless desert was now out of the question. Two alternatives only were open to Ismail Hukki, to fight or surrender. He decided to fight.

The sun rose at 6.30 on the 29th; the 34th Brigade moved from bivouac at 6 a.m., and in the early morning passed by the ruins of Ashur, resembling some huge mounds of earth without form or beauty. Excavations had laid bare the ancient brick walls, and a few great blocks of hewn marble were lying at the foot of the mounds, the last traces of the former greatness of this city built earlier than Nineveh.

A few more miles and the 34th Brigade halted in rear of 17th Divisional Headquarters. The animals were sent down to water, the men munched their biscuits or borrowed a friend's last cigarette. Till midday it was possible to watch the Highland Light Infantry on the right and the 10th Gurkhas on the left conducting a running fight on a

broad front of about a couple of miles. Making full use of the ground, they gradually drove the enemy back towards the Hawaish nala. Officers state that both on this morning, as on the hilly ground over which Coningham's column had earlier fought its way, the advance was only possible by the free use of Lewis gun fire. Sections usually worked in pairs: as soon as one section had gained a minor crest the other was able to make its way forward and in its turn give covering fire for the rest of the platoon. On one day one battalion fired over fifty magazines per gun and this without waste, or firing at long ranges, or any long bursts. The difficulties of ammunition supply were great, but these were overcome and the control of fire carefully watched. It was instructive to watch the power of infantry fire effect in a continuous advance, platoons helping platoons, and by the fire of one company the advance of another made possible. The wide extension adopted and the good use made of broken ground neutralized very greatly the effect of the enemy machine gun and shell fire.

Immediately north of the Huwaish Nala was Cassels' column, and the Turk was now hemmed in between our two forces. Some two miles south of Huwaish, the enemy held a hastily entrenched position stretching some two miles to the west of the Mosul road, with the right flank thrown well back to the north-west. This position was not dug in continuous lines, but consisted of numerous short trenches arranged in depth and sited with great skill among the high ground, that was much broken in front by deep ravines.

Orders were given that the 45th Sikhs should pass through the Highlanders, and with them capture the right of the enemy's position.

The 51st Brigade was drawn up facing this position. The two leading regiments had become rather scattered after so much continuous fighting. The Highland Light Infantry on the right, the Gurkhas on the left, were both from about eight to twelve hundred yards from the enemy's trenches. The 14th Sikhs were in support of the left of the Gurkhas, and the 45th Sikhs were held in reserve.

The 34th Brigade were to follow in rear of the 45th Sikhs and confirm their success, but not to push on beyond the 45th Sikhs unless success was definite or further orders were received.

Artillery bombardment was carried out under divisional direction, and arrangements made whereby part of the 18th Divisional Artillery were to bring enfilade fire from the left bank on to the main Turkish trenches after the advance had started.

The 45th Sikhs were ordered to attack on a frontage of 800 yards. For the bombardment to cover the assault there were only 18 field guns and howitzers, and ammunition was very limited. The difficulties of registration also were very great. No aeroplane was available to spot for the artillery. There were no good natural look-out posts, and accurate observation of the enemy's irregular and ill-defined position was impossible. The forward observation officers met with great difficulty in communicating from the front. There were no artillery officers with the 34th Brigade, as the task of the latter was but to confirm the success of the

51st Brigade. The difficulties as regards observation for the heavy guns, on targets in rear of the enemy front line, were even greater. Part of the artillery of the 18th Division on the left bank were able, however, to enfilade some of the enemy trenches with effect. There was also a shortage of ammunition due to the great difficulties of transport throughout the 40 miles between Futtah and the battlefield. Consequently the infantry could not hope for a heavy bombardment that would silence either the enemy's guns or machine guns.

As regards the dispositions of the 34th Brigade, the 114th Mahrattas were ordered to advance in support of the 45th Sikhs, on a frontage of about 500 yards, and about 1,000 yards in rear of 45th Sikhs. The 112th Infantry were to advance on the same frontage and about 500 yards in rear of 114th Mahrattas. One section 129th Machine Gun Company were ordered to co-operate on left of the 114th Mahrattas, and one section on the left of 112th Infantry. The West Kent Regiment, 34th Brigade L.T.M. Battery and 129th Machine Gun Company less two sections were held in brigade reserve.

The West Kents now numbered under 300 rifles, the 112th Infantry 350 rifles, and the 114th Mahrattas 520 rifles.

There was no reserve of ammunition, as the Brigade S.A.S. Section had not advanced beyond Futtah Gorge.

The strength of the two brigades going into battle was under 3,000 rifles. The strength of the Turks in position, apart from those opposing Cassels' column, was about 6,000.

Owing to the difficulties in clearing the wounded from Ashur ruins, the advanced dressing station of the 35th Combined Field Ambulance had not yet overtaken the brigade, and regimental aid posts were ordered to clear their wounded to the advanced dressing station of the 19th Combined Field Ambulance working with the 51st Brigade.

Leaving orders for 114th Mahrattas to gain touch with 45th Sikhs, to whom they had sent a liaison officer, the Commanding Officers now went forward to reconnoitre the ground in front.

The Tigris here runs roughly from north to south. A low strip of flat ground about two miles in width stretches from the river to a broad ridge of hilly ground broken by many deep nalas, all passable for pack animals and giving some cover from enemy fire, but rendering difficult an even advance.

It was along this wide ridge we were to advance, the enemy's main position being two miles to the north, and two and a half miles north of this ran the Huwaish Nala, the widest of all the nalas, cutting through the main ridge from west to east as it ran towards the Tigris just south of Huwaish. And north of this again was Cassels' column more than holding its own, and completely cutting the line of the Turks' retreat.

At 4 p.m. our artillery bombardment began, and 45th Sikhs, then nearly 3,000 yards from enemy, started their advance. The enemy now opened a well directed fire from 36 guns, which caused considerable losses among the 45th Sikhs and, to a lesser degree, among the 34th Brigade advancing in support.

Some 600 yards from the enemy's advanced trenches, a marked crest line runs across the battle front. As the leading lines of the 45th Sikhs crossed the ridge our bombardment ceased, the enemy machine gun fire increased in volume.[1]

Some rockets were fired, and suddenly the Turks rose from their trenches to a number estimated at over 1,000, and swept down on the advancing Sikhs.

The latter, only 600 strong, were thus outnumbered, and, being somewhat widely extended after their advance over such broken country, were forced to give ground temporarily, and the Turks pushed forward a few hundred yards until they encountered the leading platoons of the Highland Light Infantry on our right and the 114th Mahrattas in our centre. The former were strongly posted and, though the Turks approached within 100 yards, they made no impression on the defence. In the centre, the two leading lines of the Mahrattas were naturally very thin and the Turks, shooting as they advanced, pressed forward in the most gallant manner. But the 114th Mahrattas had wisely advanced in great depth. Each moment more rifle and Lewis gun fire was brought to bear on the enemy, and the counter attack was spent, and no Turks passed the line held by Headquarters and two companies of 114th Mahrattas. " Le plus obstiné l'emporte." A party, however, by accident or design, had swung westwards, and, passing the left of the 114th Mahrattas, reached eventually the high ground north of the headquarters of the 10th Gurkhas. The Gurkhas, aided by some of the 14th Sikhs, without hesitation, counter attacked, and drove the enemy back from this part of the battlefield, and here the 51st Brigade had the situation well in hand. But in the centre the situation was more critical. The Turk had driven a wedge into our line, and the right of the 114th Mahrattas was wholly open to attack. A galling enfilade fire was kept up till midnight from the right flank, and it was only by some gallant local counter attacks led by Indian officers that the position was made secure. The Subadar Major leading one of these in order to clear some high ground on the left front was killed. Out of ten Indian officers of the Mahrattas seven were killed or wounded, leading their platoons in a succession of small counter strokes. Only the steadfastness of the men, and the daring initiative shown by their leaders, enabled this regiment, not only to break the enemy counter attack, but to push the Turk back to his original line, and dig in, in some places within 100 yards of the enemy.

In the meantime the 112th Infantry had advanced some 800 yards in rear of the 114th Mahrattas. Partly owing to the numerous cross nalas, partly to the enemy shell fire, which raised considerable dustclouds, one company 114th Mahrattas, and the 112th Infantry, and both sections of the 129th Machine Gun Company, swung to the west of the true direction and their advance during the last 1,000 yards brought them up to the enemy trenches, on the left of the 114th Mahrattas. The Turks main counter attack thus passed on their right, and the 112th Infantry's

[1] Over 20 machine guns were afterwards captured in this neighbourhood.

leading company occupied the enemy's forward lines of broken trenches, and opened fire on the enemy, holding a low crest line some 200 yards to their front. Reinforced by a second company, they drove the enemy from this position also, occupied it, and dug in for the night, with the two sections 129th Machine Gun Company deployed in depth protecting the flanks of the battalion, while Lewis guns posted in the broken ground protected the centre.

This was about 8 p.m. An hour earlier, about one company of 45th Sikhs came up on the right of the 112th Infantry and so partly filled the gap existing between that regiment and the left of the 114th Mahrattas. The fact of the 112th Infantry pushing forward and holding this advanced position not only secured our left flank, but prevented any further counter attack from that direction. By the loss of direction in the advance,[1] and still more by the confusion caused by the local and temporary success of the enemy main counter attack, units had become considerably mixed.

During the night constant communication was kept up between the two brigades, and a system of defence on our new line organised. The Highland Light Infantry held the right of our line in the position from which their leading companies had never moved throughout the battle. The 112th Infantry held the left, and before midnight there were no unduly large gaps between the flanks and the centre, held by the Mahrattas and companies of Sikhs and Gurkhas. The formation of the ground determined very largely the lines of defence, which were widely extended for our numbers. The West Kents were held in close support of our second line, but it had been hard to form a strong striking force to renew the attack in the morning. The enemy kept up rifle and machine gun fire throughout the night, to which we replied with short bursts from Lewis guns and deliberate rifle fire. Our patrols were active, at first in driving in the remnants of the big counter attack, and later in locating the enemy's exact position. Two of these from the 114th Mahrattas pushed forward almost too gallantly, and were destroyed by the enemy.

The enemy continued firing till about five o'clock next morning, but just before daybreak much shouting was heard in front of the 112th Infantry; patrols returned saying the enemy was standing up in their trenches making signals of surrender, and by six o'clock the surrender became general all along the line. The unhesitating advance of the 17th Division and the failure of his counter stroke on the 29th, led the Turkish Commander to believe that there were two Divisions, not two weak

1 A telephone wire had been run from 34th Brigade Headquarters to the 114th before the start of the advance. Consequently communication with that battalion was continuous, for runners and reinforcements could find their way in the dark. But for certain reasons no wire had been sent to the 112th, consequently touch was lost and, owing to the difficulty of moving over unknown broken country in the dark, was not regained for several hours. The value of connection by telephone line, especially at night, cannot be over-estimated for, even if the wire be broken, it still forms a guiding line to runners.

Brigades, opposed to him south of Huwaish. Twenty-four hours earlier he had two alternatives open to him—to fight or to surrender. He had now no option but to surrender. At 7.30 a.m. Ismail Hakki Bey surrendered to the officer commanding the 112th Infantry, and parties of that regiment pushed forward and joined hands with the troops of Cassels' column beyond Huwaish.

So ended, after a campaign of four years, the last battle fought by the Turk in Mesopotamia—the last battle in this war fought by a Turkish army.

The stubborn resistance of the enemy in his last fight was worthy of the traditions of the Ottoman Army. Had the attack faltered, the Turk had made good his retreat. But however long the march, however short the ration, the troops had fought throughout with the one idea, of closing on the enemy. For eight days British and Indian Infantry had marched and fought with a determination that alone gives victory. On the daring of the cavalry, on the difficulties overcome by the artillery, it is needless to dwell. The work of the airmen was remarkable. Fifteen aeroplanes were daily in action, 50 reconnaissances, 50 contact patrols were carried out, and five tons of bombs were dropped over the enemy lines. That the headquarters were back at Tikrit, made it impossible for an aeroplane to arrive for some hours after the demand had been made for its services, with a consequent addition to the difficulties of observation and gaining information.

After the surrender, the 7th Cavalry Brigade and the L.A.M. cars pursued up the Mosul road, captured a further 500 of the enemy, thus increasing the total number of the prisoners to over 11,000. In addition, we captured 130 machine guns and 51 guns and howitzers. What losses we inflicted on the enemy is hard to say, probably something less than our own, which amounted to 1,870.

A few days later the cavalry pushed on and surrounded Mosul, and the town was entered under the terms of the armistice agreed to by Turkey and the Allies.

But we had not fought to seize Futtah, to gain the Zab, or to occupy Mosul. These were secondary matters. The Commander's design, as the labours and valour of the troops, had been directed to the destruction of the VIth Turkish Army. We had fought to destroy the VIth Turkish Army, and of that army not a man had escaped.[1]

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[1] Ismail Hakki Bey told me subsequently that on the evening of the 29th he had intended to retire by the desert to the west of Cassels' column during the night. Two things rendered escape in this direction impossible. First, the movement on the 28th of the 7th Cavalry Brigade had extended our line several miles further into the desert, and secondly the lack of water and impossibility of replenishing after the morning of the 29th, when the Turkish rear guard had lost touch with the Tigris. That march gives one more example of the difficulty of not losing direction by night, a difficulty more fully recognised in war when sin meets with swift punishment, than in peace manœuvre when so much can be explained.

LIST OF CASUALTIES.

	Killed.	Wounded.	Total
Royal West Kents	14	106	120
112th Infantry	1	46	47
114th Mahrattas	47	243	290
129th M. G. Co.	—	7	7
Total, 34th Brigade	62	402	464
Highland Light Infantry	78	178	256
10th Gurkhas	12	95	107
14th Sikhs	57	295	352
157th M. G. Co.	2	11	13
Total, 51st Brigade	149	579	728
45th Sikhs	36	151	187
113th Infantry	5	33	38
32nd Cavalry	1	9	10
17th Division Troops..	8	60	68
Total, 17th Division	261	1234	1495
7th and 11th Cavalry Brigades ..	—	—	212
18th Division and 1st Corps Troops	—	—	154
TOTAL CASUALTIES			1,861

This list was composed a few days after the fighting and probably contains some minor errors. The casualties of the 18th Division were mainly in the 53rd Brigade, and were about 80. The 45th and 113th both belonged to the 52nd Brigade, the former being latterly attached to the 51st Brigade.

Our losses were comparatively light, but the result was great, and it may truly be said of these operations that training leads to success, and failure breeds casualties.

INFANTRY TACTICS, 1914-1918.

IT is, of course, impossible to bring within the scope of a short article an exhaustive study of the tactics employed by our armies during the Great War, but it is the intention of the writer to endeavour to sketch briefly the changes which took place in the tactical handling of infantry during that period, and to explain the conditions which made such changes necessary.

The tactical training of the old regular army prior to 1914 was of the extended order type, the object aimed at being to get within striking distance of the enemy with the minimum amount of loss to our infantry, by advancing in short rushes with widely extended lines, covered by the rifle fire of units on the right and left. Then, having built up a strong firing line, and beaten down the fire of the enemy, to assault with the bayonet. As a result of this open order training, the British soldier learnt to think and act for himself, to look out for the best cover, to pick up targets and estimate the range, and to shoot at the rate of 15 to 20 rounds per minute, when necessary, with remarkable accuracy. Moreover, it was constantly impressed upon him that the end and aim of all his training was to enable him to close with his enemy and finish him off with the bayonet.

That these tactics were sound was proved beyond all doubt in the actions in which the British army was engaged in the early stages of the war, before the opposing armies settled down to trench warfare. The enemy suffered very heavy casualties from his attempts to advance in massed formations against the rapid and accurate rifle fire of our infantry, and our casualties were much less than would have been the case, if the tactics adopted by us had not been of the extended order type. But the British Army was at a very serious disadvantage in the small number of machine guns with which it was equipped, and in the lack of the co-ordination of their fire. The enemy was found to have many times the number of machine guns which he had been supposed to possess, and handled them with remarkable skill and daring, bringing them up into his firing line, or even in front of it, into positions from which they could take their targets in enfilade or in reverse. Throughout the campaign the proportion of machine guns, supplemented later by light machine guns, employed by the enemy in or in close support to his front line, was very high, both when he was attacking or on the defensive. The Germans were undoubtedly the first nation to realise the possibilities arising from the free use of large numbers of machine guns with their infantry, and the German machine gun was the chief factor in bringing about the various changes which were made in our tactics during the war.

With the settling down of the opposing armies to trench warfare, the introduction of the bomb, with various types of bomb throwers and trench mortars, became inevitable, since it is obviously impossible to inflict much damage with the rifle or machine gun on an enemy who has gone to ground in deep trenches and dugouts, protected with broad belts of barbed wire. Bomb throwers and the earlier types of trench mortars were very clumsy and imperfect weapons, and had no influence on infantry tactics, but later in the war lighter and more handy types were evolved, which could be employed with attacking infantry as a kind of light field artillery.

The hand and rifle grenade, however, had a rapid effect on minor tactics, for with the introduction of these weapons the platoon became a self-contained fighting unit. It could now take on a strong point by itself, the platoon commander using his rifle grenades as his artillery for the preliminary bombardment, covering the enemy's line of retreat with his Lewis gun, and finally enveloping and assaulting the objective with his rifle sections, using the bayonet to kill his enemy above ground, and the bomb if he went to ground in a dug out. A preliminary bombardment by rifle grenades would only be intended to make the enemy keep their heads down, and so minimise the casualties in the assaulting sections, and would not be of any use for destroying or cutting passages through barbed wire entanglements, but here again the platoon commander was furnished with a weapon, in the shape of the Bangalore torpedo, which made him independent of the gunners for wire cutting. With this invention it is possible to destroy every shred of wire over a radius of action of several yards, only two or three men being required to place the torpedo in position. The hand, and rifle grenade, and the Bangalore torpedo, therefore opened up a wide vista for an enterprising company or platoon commander in the sphere of minor tactics, and these tactics were gradually developed and improved upon in the raids which were of almost nightly occurrence on both sides, during the long period of trench warfare. These raids were carried out with the double object of inflicting as much damage as possible on the enemy, and of obtaining identifications, *i.e.*, prisoners, or articles of clothing and equipment from which the units to which they belonged could be identified. The force employed varied in size from a platoon to a brigade, and the tactics employed were similar to those used in the ordinary trench to trench attack, which will be described later, except that the attacking force did not attempt to consolidate and hold permanently the ground gained, but only to hold it sufficiently long to enable them to kill or capture the garrison, and to wreck their dugouts and mine-shafts.

About this time the Lewis gun began to come into its own. These weapons were supplied to the infantry in 1915, to eke out the inadequate supply of machine guns, and were at first used as machine guns. But gradually it was recognised that the Lewis gun is in reality an automatic rifle, with a far greater mobility than the machine gun, but without the power which that weapon possesses of keeping up a steady rate of fire for long periods, and of giving accurate indirect covering or harrassing

fire. In the subsequent training of Lewis gun teams much emphasis was laid on the mobility of the gun, and on the necessity for handling it boldly and aggressively. A Lewis gun section, if properly trained and handled, presents a very inconspicuous target, can bring a heavy and concentrated fire to bear in any direction within a few seconds, and can keep pace with the rifle sections during an advance.

A factor which had some effect on minor tactics in 1915 and 1906 was the offensive and defensive mining undertaken by both sides: offensive mining with the object of blowing up an enemy trench or strong point, and defensive mining to destroy the enemy's mines before they became dangerous. The blowing of one of our mines under the enemy's lines gave an obvious opportunity of making ground and inflicting casualties on him, and an attack was usually timed to coincide with the mine explosion, with the object of occupying and consolidating the crater as rapidly as possible, and connecting it by saps or communication trenches with our front line. The tactics employed were much the same in every case. Bombing parties were detailed to guard the flanks and to make bomb stops in all trenches leading forward or sideways from the crater, and were supported by Lewis guns posted in suitable positions. The duty of the remainder of the attacking force was to dig for their lives on the inside of the forward edge, or the outside of the rear edge, of the crater, according to the plan of operations decided upon beforehand. Other parties were also detailed to dig communication trenches forward from our front line. The actual formations adopted by the various parties, *i.e.*, line, or sections in single file, in their rush forward were of little importance, the main essential being that the attack should be carried out at top speed the moment that the explosion took place. If it became known that there was danger of a German mine being blown under a section of our trenches, the dispositions usually adopted were to construct bomb stops on the flanks of the threatened piece of trench and to cover it with Lewis guns sited in rear of it and on the flanks. The trench was then evacuated, and special parties detailed to reoccupy the ground immediately after the explosion. The evacuated trench was, of course, patrolled at night to prevent enemy patrols from entering it.

The use of cloud gas and gas shell by the enemy had no direct effect on our infantry tactics, but led to the introduction at a later period of gas projectors, which were used by us with great effect, a large number of projectors being concentrated in one place, and fired simultaneously by electricity, to obtain the maximum surprise effect. The shortage of rubber in Germany prevented the enemy from being able to equip his troops with a gas mask which would afford them complete protection against our gases, and as a natural result our gases were much feared by the enemy, and inflicted serious casualties upon him. These facts were exploited to our advantage in many ways, of which the following is a typical example. A selected area of enemy trenches would be subjected to frequent hurricane bombardments with gas bombs and smoke shell, which forced the enemy to put on their gas masks, and take cover in dugouts fitted with gas proof curtains. Finally, one night the usual

bombardment would be carried out with smoke shell and high explosive only, but the enemy could not afford to take any chances, and would put on their masks and take cover as usual. A raiding party would slip across, and, unhampered by wearing gas masks, would take the enemy garrison at a heavy disadvantage.

In all these various forms of minor operations, the German machine gun played a very prominent part. A large number were sited at frequent intervals along the enemy front and support lines, and on the slightest suspicion of an alarm broke out into bursts of fire, which were of far greater effect than the enemy's defensive barrage. In spite of the most elaborate system of coloured light signals from the front line to the guns, a few minutes must necessarily elapse before a defensive barrage can be put down, and a well-led raiding party should be in the enemy's front line before his barrage can come down, and would then only have to pass through it on their way back. But, however quick they might be, the German machine gunner was an alert fellow, who appeared to live with his thumb on the button of the gun, and usually got in at least a few bursts of fire. His guns were invariably well sited, and their belts of fire co-ordinated to cover as much as possible of the ground in front with enfilade fire and to sweep along the face of his barbed wire entanglements.

The minor operations which were carried out during the long period of stationary warfare were of great value in training our infantry in the use of their various weapons, in making them accustomed to moving over the open, and in fostering the offensive spirit.

Before the British and French attack of the 1st July, 1916, the divisions selected for the attack were put through a special course of training over dummy trenches, which had been worked out to represent the actual ground over which the division would attack. The tactics employed were very similar to the old open order form of attack, the two leading companies moving forward in lines, followed by the support and reserve companies in sections or platoons in artillery formation. The leading companies were ordered to advance to the final objective, closely backed up by the support company, whilst the reserve company acted under the orders of the Battalion Commander to push home a success or to beat off a counter attack. These tactics were inadequate for two reasons. They did not take into consideration

1. The possibility of the enemy taking cover in their dugouts until the attack had passed over them, and then coming out again to take the assaulting troops in reverse with machine gun and rifle fire.
2. The fact that our men were carrying a heavy and cumbersome load of bombs, Lewis gun drums, extra bandoliers of S.A.A. and tools, etc., in addition to their ordinary equipment.

The first difficulty was overcome in subsequent attacks by detailing special companies or platoons, who were known as " moppers up." They were attached to each wave of the assaulting battalions and, having

arrived at their pre-arranged line of trenches, remained there to explore the dugouts, and to ensure that none of the enemy were hiding in them, while the assaulting troops went on. They were usually detailed from a support or reserve battalion, and were distinguished by coloured shoulder-straps or arm-bands. This method of dealing with Germans who had gone to ground achieved its object, but nevertheless was unsatisfactory, in that it entailed an unnecessary number of troops being with the leading waves and exposed to machine gun fire when it was at its maximum, *i.e.*, while the leading waves were crossing " No Man's Land," and before they had had an opportunity of silencing the machine guns in the enemy's front line. But it remained the method most commonly employed, until the introduction of the " leap-frog " system of attack in 1917, which will be described later. The question of the equipment, battle stores, tools, etc., which should be carried by the men in an action is one which has a direct bearing on the form of tactics which can be employed in that action. The two conflicting principles which have to be considered are

(*a*) That the more lightly a man is equipped the better he can fight, and

(*b*) That against a skilful and determined enemy it is useless to waste lives in the assault and capture of a position, unless the assaulting troops are provided with tools for the consolidation of the position, and sufficient S.A.A. and bombs with which to beat off the enemy counter attack.

It is obvious that troops who are heavily laden with buckets of bombs, tools, etc., cannot be expected to attack to a depth of, say, 3,000 yards over several lines of trenches with sufficient impetus to crush a determined resistance, especially if the ground is water-logged and badly torn by shell fire. And in addition to the question of fatigue is the consideration that a man who is carrying a bucket of bombs in one hand and a shovel on his back cannot make the best use of his weapons. On the other hand, it is equally obvious that the necessary tools and battle stores must be carried to the final objective by someone. It is outside the scope of this article to go into the details of the various schemes that were suggested and tried for overcoming this difficulty, and it will be sufficient to say that, until 1918, the method almost universally adopted was to equip the actual assaulting troops as lightly as possible, and to detail carrying parties to follow them up with the necessary stores. In 1918 special " supply tanks " were provided, two of which were capable of carrying all the stores likely to be required by an infantry brigade.

It should be noted here that the infantry, when carrying out an attack, advanced under the protection of an artillery barrage. The barrage was usually divided into two parts, the " rolling barrage " and the " standing barrage." The former was composed almost entirely of shrapnel, with a sprinkling of field howitzer H.E. It opened on a definite line, which might be in " No Man's Land " or on the enemy's front line, according to circumstances. There it remained for a few minutes to

allow the leading wave of infantry to get up close to it, it being impressed upon the men that the nearer they were to the barrage the safer they were from the enemy's machine gun and rifle fire. The barrage then moved forward by lifts of 50 or 100 yards at a time, at the rate of 100 yards in four, six, eight or more minutes, according to the condition of the ground, the nature of the obstacles to be met with, and the expected degree of resistance on the part of the enemy. The infantry followed as close to it as possible, and rushed each trench or strong point immediately the barrage had rolled over it, and, if they were quick enough, they were into the enemy with the bayonet and bomb before he had time to get his machine guns and rifles into action. A point of special interest about the rolling barrage is that under its protection the assaulting infantry were able to move forward at a steady walking pace, instead of being compelled to advance by short rushes, and so were able to conserve their strength and wind for the actual hand-to-hand encounter. The standing barrage was formed by 60-pounder shrapnel and H.E. from the heavy howitzers, which were directed at selected points in the enemy's defensive system, such as trench junctions, headquarters, and covered lines of approach, with the object of preventing the forward movement of supports or counter attacking units. As the rolling barrage reached the spot at which any guns of the standing barrage were shooting, these guns lifted on to more distant objectives or became part of the rolling barrage, and lengthened their range in accordance with it. Finally, when the rolling barrage had reached a line 200 to 300 yards beyond the final objective of the infantry, it remained there as a standing protective barrage for a pre-arranged length of time, to cover the consolidation of the newly won positions, and to smash up any possible counter attack.

But even under the punishment inflicted on him by the barrage the German machine gunner stuck to his gun, and inflicted such heavy casualties on our infantry that it became clear that some new device must be adopted to deal with him. Experiments had been carried out for several months with various types of armoured cars driven on the caterpillar system, for use over broken ground, and eventually, in September, 1916, these cars, or " tanks " as they were called, were used for the first time. They were not a complete success, owing to mechanical difficulties, but those that did not break down were found to be able to deal most effectively with machine gun nests. Improved types of tanks were brought out in ever increasing numbers, and various experiments were made in the co-operation of infantry and tanks. As a rule the tanks moved in advance of the infantry to make a passage for them through obstacles such as barbed wire, hedges, etc., and to keep down the fire of the enemy machine guns by the fire of their own quick-firing guns and machine guns, and by crushing the machine gun nests wherever they could locate them. The infantry worked in platoons or sections, in file, or single file behind the tanks to mop up and hold the captured trenches. Tanks can capture a position, but cannot hold it for more than a very short time, and infantry working with tanks must be quick

to seize the opportunities made for them by the tanks. A simple system of signals enables the tanks and infantry to communicate with each other. This is necessary on account of the very limited field of vision from the interior of a tank, which often prevents the tank commander from locating and engaging targets which can be plainly seen by the infantry. When it is remembered that the sole object of the tank commander is to ensure that the infantry advance is not held up by natural obstacles or the resistance of the enemy's infantry, it is obvious that the closest co-operation between the two arms is the essence of this form of attack.

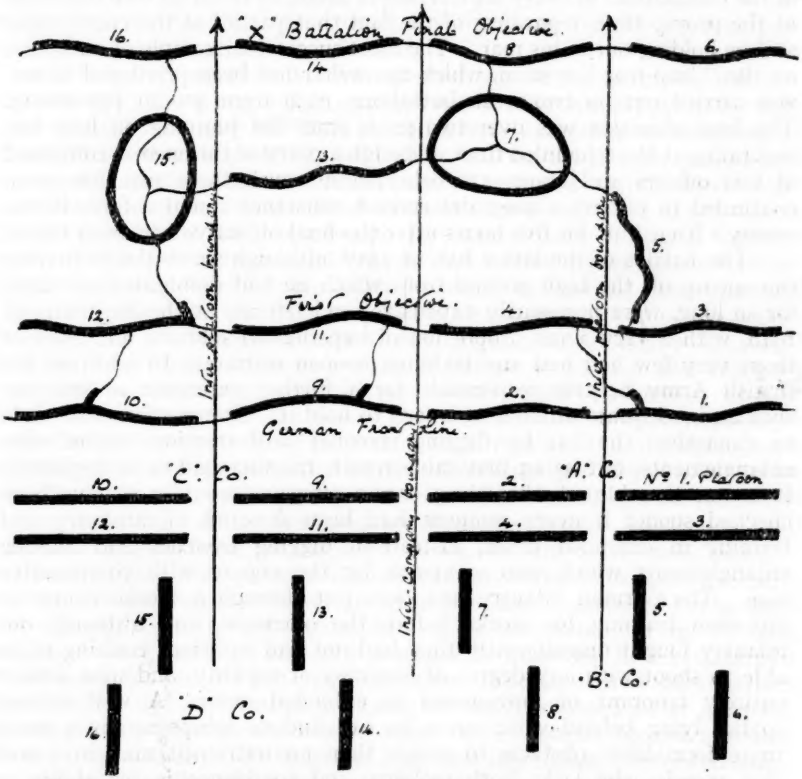
With the menace of our barrage and tanks before him it became imperative for the enemy to devise some form of above-ground protection for his machine-gunners, and therefore, during the winter of 1916-17, he took up the use of reinforced concrete for the construction of his famous "pill boxes," which began to appear everywhere, in the ruins of houses, in suitable positions in the open, and at important points in his trench system. The problem thus set to us to solve was a formidable one, for the German machine-gunner inside his "pill box" was safe from tanks, and from all except the heaviest types of shells. A "pill-box" is, of course, vulnerable to heavy howitzer fire, but it is a small target and not easy to hit. The "pill-boxes" were usually arranged chequer-wise, so that the blind side of one was covered by the fire of other "pill-boxes" in the vicinity. Smoke-screens, mists, and darkness were all turned to advantage by us in our attacks, but even when surrounded the occupants of a "pill-box" could still put up a protracted resistance, until the attacking infantry could crawl up near enough to bomb them out. This all took time, and meanwhile the barrage had rolled on and was lost, and so the "leap-frog" system of attack was adopted.

The principle of the "leap-frog" system is that the leading troops attack the first objective only, and remain there to clear it up and consolidate it for defence, while other troops pass through them to attack and clear up the second objective, and so on. The attached diagram of an attack carried out on the "leap-frog" system by a battalion explains itself, and shows how each platoon in the battalion has one objective and one only. The diagram is not intended to indicate that each battalion must necessarily employ all its companies in the attack. A battalion commander, who considered that he could clear the area allotted to him with three companies, would attack on a two company frontage, and leap-frog one company through them, or attack with one company first and leap-frog two companies through it. Either plan would leave him one company to act as a reserve. The following are some of the more obvious advantages of the "leap-frog" system:—

1. With only one objective to consider the platoon commander can concentrate the whole of his attention on getting there, and on clearing and consolidating it when he has captured it. He can also make certain by means of maps, aeroplane photographs, and lectures, that every man in his platoon knows what his objective is, and the route to it. This is a very material advantage, for if each man knows what he has to do

he can usually be relied upon to do it, even if his officers and N.C.O.'s become casualties.

2. If some portions of the enemy's front line system hold out, the attack still goes on to the new objective and the barrage is not lost. The platoons detailed to take the first objective settle down to their job of surrounding and eventually rushing the parties of the enemy who are



Below the German front line "X" Battalion is shown in assembly formation. Above the German front line each platoon is shown on its objective. A and C companies have assaulted the first two lines of trenches; B and D companies have gone through them to the Battalion final objective.

If a further advance had been planned, "Y" Battalion, starting from assembly positions in rear of "X" Battalion, would go through and take on the fighting beyond the "X" Battalion final objective.

still holding out, while the platoons detailed to go through, work round the flanks to avoid being drawn into the fight, and then pass on to their own objectives. By so doing they make the position of the enemy who are holding out more hopeless than ever, and may cause them to surrender.

3. The troops detailed for the final objective do not have to take the brunt of the fighting all the way, but have the keen edge of the enemy's resistance blunted for them by their comrades, and so are fresh and able to carry on the attack to the final objective with the necessary impetus.

The success of this form of attack depends upon the determination of the commander of every unit, however small, to reach its own objective at the proper time, regardless of the fact that parties of the enemy may still be holding out in his rear. The most successful example of an attack on the " leap-frog " system, which the writer has been privileged to see, was carried out by two weak battalions, each from 400 to 450 strong. The final objective was over two miles from the jumping off line, but was taken at the scheduled time, although a party of the enemy, composed of two officers and about 110 other ranks, with three machine guns, continued to put up a most determined resistance round a farm in the enemy's front line, for five hours after the final objective had been taken.

The battles of the latter half of 1917, although successful in driving the enemy off the high ground from which he had dominated our lines for so long, were necessarily expensive, and left us, at the beginning of 1918, with a very small proportion of experienced soldiers, and even of those very few had had any training in open warfare. In addition the British Army became responsible for a further extension of its line, with an inadequate number of troops to hold it. Every effort was made to strengthen the line by digging trenches and erecting barbed wire entanglements, but as an inevitable result, training had to be neglected. It is questionable whether the German offensive would not have been checked sooner if every moment had been devoted to musketry and training in extended order, instead of digging trenches and making entanglements which were over-run by the enemy with comparative ease. The German infantry had been put through a special course of intensive training for weeks before the offensive, and although our infantry fought magnificently they had not had sufficient training to be able to shoot with any degree of accuracy or rapidity, and were almost entirely ignorant of movements in extended order.. A well trained soldier lying behind what cover he can find or scrape up, is a much more formidable obstacle to tackle than an untrained man in a well dug trench, who lacks both mobility and confidence in his ability to stop his enemy with the bullet.

The method of attack employed by the Germans during their advance in March, 1918, was admirably adapted for dealing with an untrained enemy. After a preliminary bombardment of great intensity, and under cover of a thick mist, masses of men were launched against our lines, the assaulting troops being accompanied by a large proportion of machine guns, and light trench mortars on special mobile mountings. The defence was greatly hampered by the mist, which reduced the range of visibility to about 100 yards or less, and rendered our numerous machine guns and forward sections of field guns practically useless. These had been very carefully sited in depth, and might have succeeded

in stopping the enemy's advance if the visibility had been good, but in many cases they were surrounded before they had seen any target at which to shoot. Having broken our defensive system, and carried the fighting into open country, the enemy avoided making frontal attacks on centres of resistance, but sent machine gun batteries to work round the flanks, and by heavy enfilade fire forced the troops that were holding out to retire. Here, again, the Germans gave us a practical demonstration of the great value of both light and heavy machine guns, when handled boldly and intelligently.

During the final British advance which forced the enemy to sue for an armistice, the " leap-frog " system was usually employed up to the time when the enemy had been driven out of his defensive zones into the open country, after which the open order tactics of 1914 came into use again, strengthened by the free use of our powerful artillery and machine gun organization. That it has been possible to adopt such tactics successfully, with practically untrained troops, is greatly to the credit of the junior regimental officers and section commanders. It is almost impossible for a company commander to exercise close control over the whole of his company, when it is attacking in depth over a wide frontage, and the success or failure of an advance under heavy machine gun fire must depend largely on the initiative of platoon and section commanders. Although often very inexperienced themselves these junior commanders have shouldered their responsibilities with wonderful keenness and energy, and by their example of courage and determination to succeed have compensated for the lack of training of the men. As for the private soldier, the courage, endurance, and unfailing good humour displayed by him under the most appalling conditions are beyond all praise. For four years he has lived in an atmosphere of mud, blood, lice, and all the intense discomfort of modern warfare ; shelled, gassed, and bombed by day and night ; often half frozen or plastered up to the eyes in mud, and yet has made light of his hardships and turned up smiling. Twice beaten back by overwhelming numbers in a retreat in which a panic would have meant complete disaster ; half blind with lack of sleep and exhaustion, but still contesting every foot of ground against the fresh masses of troops which were brought against him in attack after attack. The British soldier, whether trained or untrained, has proved himself to be a stubborn fighter both in trench warfare and in the open, but there can be very little doubt that it is the open typ of warfare in which, when properly trained, his qualities of individual courage and enterprise find their fullest expression.

ARTILLERY AND THE GENERAL STAFF.

By F. W.

ASSUMPTIONS.

LET it be granted—

(i) That, subject to ordinary human desire to be safe and comfortable, and to get the usual ration of sleep, the great ideal of "gunners" is to support their infantry properly, which corresponds to all other great professional ideals; for instance, the success of a raid was a very real pleasure to the gun detachments.

(ii) That a battery starts the war fairly efficient, but short of experience, and that, as it gains experience, it loses efficiency from casualties.

(iii) That the rank and file of any unit knows little about things outside its own sphere of life.

FOREWORD.

The writer spent half the war as a General Staff Officer and half as a Regimental Artillery Officer—his only excuse for the following platitudes.

Often there is no artilleryman on the staff of a formation of all arms; the influence of the formation staff, shy of artillery technique, is exercised largely in saying "*Don't,*" like an anxious nurse, and not always giving the maximum *assistance* to the Artillery Staff Captain, part of whose work is the comfort of the artillery, but whose position is too junior to get all that is necessary, and whose hands are already full of priority work dealing with ammunition.

It is not pretended that the artillery is blameless. Gunners prefer to run their own administration (and, indeed, it is the best solution of the problem), but once taught by experience to look for help from their Formation Staff, they will not try to obtain the necessary assistance through some other channel—a course which may work against true co-operation.

The writer once heard on his telephone a conversation between an outgoing and an incoming (artillery) brigade-major; said the latter: "I suppose I must tell 'G' we're in?" "Why?" said the outgoing man, "they never think of us." That speaker is now a senior General Staff Officer, and one wonders . . . . A wrong spirit, of course, but not so uncommon as it should be, and provocation for it is not always absent. One plays into one's partner's hands unless one has overwhelming cards oneself. The infantry and artillery are, or should be, partners in the greater game.

"G" AND THE ARTILLERY.

It is suggested that the assurance of co-operation *between* infantry and artillery is the special duty of the senior G.S.O. (The word co-operation implies that the assistance must be mutual.) To perform the duty doubtless requires "personality," but that kind of personality can be gained by study, because authority is based on knowledge. The duty has two phases—initiation and observation, both of which demand a degree of expert knowledge of artillery matters; G.S. must put Training on the correct lines, but that does not absolve it from the duty of Criticism during progress.

Granted the initiation has been correct, responsibility for criticism can be allocated; for instance, G.S. is probably the best critic of opportunity for fire, while the Technical Staff is the best judge of effect; whether delivered from the right place interests both critics. Again, in battle, the Artillery Commander is the authority to criticize the positions occupied (subject to certain limitations), the upkeep of equipment, and the soundness of the gunnery; but a good General Staff Officer can efficiently test and criticize communications, observation, alarm arrangements, liaison, distribution of batteries, and their mobility; and G.S. are scarcely ensuring co-operation if not personally acquainted with existing conditions in this respect. The knowledge gained by the critic in his attempt to criticize will be the very life-blood of orders that he may be called upon to give in the future, for a mental picture of conditions as they are will be present to him when fighting by the map.

One cannot rest satisfied after grouping a body of infantry and artillery together unless (*a*) one is acquainted with the two commanders; (*b*) those two commanders have worked satisfactorily together before.

It is not asking too much of G.S. occasionally to watch bombardments; it requires no great technical knowledge to see whether the right target is being bombarded, whether the shrapnel is bursting evenly, while a hint that the Commander is watching shooting with his own or his representative's eye must have a salutary effect at the gun-position and the O.P.

Synchronization is a G.S. duty, and amongst the writer's unpleasant experiences has been one in which casualties were caused to the infantry owing (ultimately) to the fact that the responsibility for synchronization had not been definitely allotted to one individual.

Occasionally—in fact too often, under our system—a force of artillery is brought into action which is not under direct command of the senior artillery officer of the formation responsible for the operation; it then becomes the duty of G.S. to ensure that things are put on a correct basis. To exemplify this, one can quote the sad case of a G.S.O. who could not at a moment's notice answer the question as to exactly what heavy guns were actually cutting certain wire on his division's front; it was, as a matter of fact, impossible to say, for the heavy guns in question were not under the divisional C.R.A., and had not one but several tasks—i.e., the arrangements were not on a satisfactory basis; had their G.S. made it their job to ensure

they were, not only a reputation but a number of soldiers' lives might perhaps have been saved.

Gunners want rest and sleep, relief and training, like everyone else; this is for consideration by the General as well as by the Technical Staff—one usually finds G.S. pretty careful as regards its infantry.

It is the greatest compliment the "gunners" can receive to know that their own infantry are glad to have them close at hand, but a divisional artillery has been known to crawl back half destroyed from the battle into its own division's rest-area, after an extra long turn in support of other troops, without any marked exuberance of feeling about its arrival; it is as if one failed to notice the return of one's mate after an absence. It is possible that the gunners are equally to blame.

Training.

The principal method of *initiating* co-operation is by ensuring that each arm gets practical experience of its partner. This has been attempted in several ways:—

(*a*) By attachment of selected officers *and selected N.C.O.s* for periods not under one month; two months would be better. We ought to teach N.C.O.s to deal with units other than their own. The attachment should be at a period in the year when men's minds are occupied in other things than football and leave, but it need not necessarily be during manœuvres. It is essential that the attachés live with the unit to which they are attached. The personality of the individuals attached is of the first importance—to send (in topical slang) "duds" does more harm than good; those selected should be "professional soldiers," capable of strong views and of upholding those views in discussion. On less important exercises, the attachés should perform the duties of their rank. At the end of the attachment the attaché should send in to his own C.O. a report of his attachment *under specified headings,* and the writer sees no reason whatever to exclude criticism from those reports—it is only by criticism that one learns to differentiate between bad and good, and, besides, it tickles the palate.

(*b*) By attendance of artillery officers at tactical musketry and of infantry officers at tactical practice. The schemes for such exercises might be made in consultation with a representative of the partner-arm; but, where competition comes in, it is doubtful if it is wise actually to employ the attachés during the exercise.

(*c*) By lectures—lectures to infantry by an artillery officer, or a G.S.O. presenting the artillery side of the question; lectures to artillery by an infantry officer or a G.S.O. presenting the infantry view. The presence of G.S. at such a lecture is much appreciated by the artillery, and representatives of each arm should be detailed to discuss the question at the end of the lecture; a little "sparring" does no harm, and, if tactfully conducted, loses nothing from the sharpness of the thrusts delivered, while it will almost certainly occasion domestic discussion that evening.

(*d*) Through tactical schemes (field days). It is impossible to make a scheme for artillery without considering where the infantry would be; but the writer has been present at many infantry schemes in which the artillery has been entirely left out; even if it is only to say "there is no artillery present," it is something. A tactical scheme ends in a conference or discussion; the representative of the partner-arm should as a matter of drill be asked what he has to say on the exercise.

(*e*) By simple tactical exercises (without troops) conducted by G.S., in which a situation is given, and the infantry and artillery positions selected on the ground and visited in detail, reasons being given by the officer who selected them for their selection—defilade, camouflage, background, supply of ammunition, facilities for exit, etc.

It might be beneficial if the same terms and habits were in force in each arm—in such simple things as the mode of measure of lateral angles, the use of the degree and minute, and so on. Both arms need instruction and experience in map-reading and *resection of position*—more mistakes have occurred from incorrect resection than one cares to contemplate; mixed classes from infantry and artillery could study this subject together, also the practice of reconnaissance and patrolling.

So much for the G.S. duties in initiating the principles of co-operation; it remains to ensure that these principles are being carried out in practice.

Criticism of artillery work at manœuvres has not in the past been efficient; so noticeable was the lack of attention to the part taken by artillery, that it became an expensive but effective custom, just before the war, for the artillery to draw attention to itself by firing off rounds of blank at a quick rate of battery fire (or salvos) to remind all and sundry of its existence; the umpiring needs to be done every bit as carefully at manœuvres as at "practice." A battery which has exposed itself previous to occupation of a position, guns emplaced where they could not clear the crest, breakdown of communications, are causes of inefficiency, which, if passed unnoticed, constitute bad training and will at the great test occasion failure and casualties.

Co-operation between heavy and field artillery needs as much "forcible feeding" as does that between infantry and artillery.

Position Warfare.

Normally, position warfare implies the local defensive, and the obvious thing to work for is a good S.O.S.—i.e., alarm arrangements. The exploitation of light signals in our army took place only very slowly. Failing the use of coloured lights, one is dependent on communications, a just appreciation of the importance of which is the first step towards the proper direction of artillery fire. The writer was on a certain occasion ordered by the Technical Staff to construct rearward positions in the event of withdrawal; now *reconnaissance* of rearward positions is a necessity, but construction is of doubtful value, for they get known to the enemy, and, worse still, they tempt batteries to occupy them even if not suitable to the tactical situation

of the moment—and so it turned out on this occasion; the labour devoted to building rearward positions would have been better expended on burying communications in the forward area, for it is conceivable that a good artillery defence might have obviated the need to withdraw at all; it was thought that G.S. might have laid down such priority in the defence scheme.

When compiling the defence scheme, there is a very human tendency on the part of the collator to get it completed and to accept contributions for the purpose without properly examining them. A defence scheme existed in which the artillery defence formed one (not even the first) of many appendices. The point is that the artillery and the infantry defence are inseparable and interdependent. G.S. initiates proper co-operation by a defence scheme; a further task is to see that it is properly studied and applied by each single unit, artillery as well as infantry, to its own circumstances.

Artillery defensive arrangements do not, however, consist only in the putting up of a good S.O.S. barrage; they must contemplate artillery action (*a*) before the attack, in the shape of counter-preparation, (*b*) after the assault has taken place; first attacked on March 21st, 1918, the writer does not remember being informed of a definite policy regarding (*b*) until July, when it was laid down that in event of a hostile offensive, batteries would continue to fire on their old S.O.S. lines unless otherwise ordered, so as to stop hostile reinforcements—a very, very old policy half-forgotten; certain artillery units were detailed, whose fire could be switched on to any gap which the enemy may have forced. It is not the object of this paper to discuss whether such a policy was right or not, but rather to note the need of a G.S. policy of some kind.

In position warfare, there is generally very little trouble as regards liaison and observation, but the certainty of being able to speak to anyone at short notice in an old-established line, led to the emplacement of O.P.s in positions quite unsuited to an enemy offensive and to an exaggerated expectation of liaison on the part of the infantry, which it needed such a shock as the German offensives in 1918 to rectify. For observation and a good artillery defence, the one essential is safe communications—far more so than in the attack, at any rate until the artillery has moved forward and is once more on the defence against a counter-attack.

The early stages of an attack from and against trenches are better understood; or may it be that they are made before that bugbear, the *will of the enemy,* has been consulted? In any case we seemed efficient at the art of distributing responsibility for bombardment (when once the creeping barrage had become a drill), of fixing the first line of the barrage, the lifts, and the protective line, so far as position warfare was concerned. In the later stages of an attack, however, especially where a salient had been formed, there cropped up often the question of short shells—the great enemy of good feeling, and one which demands intimate knowledge and patient study on the part of G.S., before one approaches the truth. It is perhaps worth

while to enumerate the various kinds of evidence which help to settle this question:—

(*a*) A dud shell or a bit of a shell, picked up at the time;
(*b*) the exact place the shell fell;
(*c*) the exact time it fell;
(*d*) the direction, if possible, by flash; failing that, by sound;
(*e*) whether the offending projectile was light or heavy, came fast or slow.

One can then hope to find out what guns of what calibre were firing at that time, and test the suspected gun. The writer, having good and clear evidence from the infantry, was on one occasion able within thirty minutes, by the process of elimination, to fix responsibility on one of two detached sections out of a group of seven batteries; and an honest officer, who perhaps deserved praise for his honesty as well as censure for the mistake, pleaded guilty to a wrongly-set sight; another time a bad-shooting gun was located; more often no decision was reached, and one had to suspect the enemy of the offence. No amount of trouble on the part of the Staff is too great to get a definite answer to this gravest of complaints.

One cannot leave this chapter without reference to trench mortars. In position warfare they provide a lion's share of the preliminary bombardment, from which it is argued that they should be under the artillery, though the supervision of their work takes the artillery commander out of his usual sphere—which has its advantages as well as its defects. On the other hand, it can be argued that they are sited in the infantry area; that they fight in support of the infantry, against the enemy infantry area, and that infantry are almost always required to carry up the ammunition; and that therefore they should be controlled by G.S. working through infantry channels. This was a controversial question at one time, but decision generally favoured making them an integral part of the artillery.

In position warfare, especially, G.S. has to ensure working co-operation between the artillery and aircraft.

War of Movement.

We never reached this war of movement, unfortunately; we got near it at times—forming up for assaults on ground practically unknown, almost unlimited objectives, disappearance of telephonic communication in the later stages, disappearance of ammunition dumps at the gun positions, etc. Barrages we were never able to dispense with; in fact they were so much in demand that it almost needed interference from G.S. to limit that demand. It was in connection with these "lightning" barrages that the artillery was hardest tried; for they are never easy to arrange *if they are really needed*, and the delay caused by continual changes in "forming-up places" and "first objectives" used to result in insufficient time at the gun-positions to put them properly into execution—a thing which, owing to the really strenuous efforts of the artillery, G.S. perhaps hardly realized.

In such actions as one was called upon to fight from August, 1918, till the armistice, development could never be foreseen; communication by mounted orderly only was not feasible in the preliminary stages of such a battle, and telephonic communication was essential for such matters as dictating the moment for guns to advance. As before, so still at that period, the proper direction of artillery was dependent on telephonic communication; once the headquarters had been fixed upon, and wires laid out, dispositions could not be changed under several hours' notice. The aim of the artillery was to have its headquarters with those of the infantry it was supporting, the better to be able to deal with what circumstances might arise; if, after laying out the artillery plan in wire on the field, the infantry headquarters were changed, the infantry and artillery commanders became separated, and the artillery had to be represented at infantry headquarters by a liaison officer. But no liaison officer is as equal to the task as the artillery commander himself; unless he has the rank and personality and knowledge to gain the confidence of both his own commander and the infantry brigadier, he is almost useless—and such officers were almost always commanding their batteries.

Without going further into this subject, it may be admitted that "liaison" between infantry and artillery is what G.S. must principally watch when the battle begins to move; and there was a widespread feeling in the artillery that (granted the importance of the two commanders being side by side) infantry brigadiers did not always sufficiently consider the necessity for the artillery commander being located where it was possible for him to direct his fire (i.e., control his batteries) as well as to keep close touch with the infantry progress.

Facilities for observation also want watching; not so much the choice of an O.P., which may be left to the artillery, but the gaining of ground by the infantry which is needed for artillery observation.

The writer's experience is that G.S. could get better value for information during the battle from the mounted patrols which the artillery must for security send out to the flanks; or perhaps it is that the artillery commander did not always report back the very valuable information that these patrols sometimes obtained, when well handled.

G.S. fixes zero, but occasions have been known when the artillery, hard put to it for issue of barrage orders and supply of ammunition, might have been consulted.

In the more "sticky" stages of an advance, when the enemy is only being beaten back very slowly and is well provided with guns, the artillery needs a helping hand as regards allotment of available accommodation; everyone knows what happens to dug-outs in a just captured area.

Suggestions.

It requires some temerity on the part of the writer to make the following suggestions for the better performance of G.S. duties towards artillery:—

(*a*) It is easier to discuss matters when people live together in the same house; artillery needs are reported to the artillery commander

if they cannot be adjusted on the spot; the artillery commander (whether brigade, division, or corps is concerned) is, from the artillery point of view, best situated *in mess with* the infantry commander, if it be possible to overcome parochial difficulties to attain the great end.

(*b*) However good the artillery, however capable its commander, support will be better for sustained observation and reasoned criticism by G.S. For this criticism some degree of technical knowledge is desirable. Moreover liaison between heavy and field artillery is sometimes lacking, which G.S. can discover, even if they cannot rectify.

(*c*) An operation order should never be written without some reference to the artillery—even if it is only to say (for the benefit of an incoming formation) that "such and such artillery (Commander So-and-So) is in support of the outgoing formation"—or that "the 100th Division (less artillery) will be relieved on the night X/Y." Orders and Instructions are seen too often whose wording shows that the writer was thinking only of infantry.

(*d*) There should be an officer on every artillery formation staff to deal with ammunition—he works partly with "G" and partly with "Q"; his existence will allow of the better performance of the real "Q" duties by the present overburdened staff captain.

THE TRANSCASPIAN EXPEDITION.

By Q. L.

[AUTHOR'S NOTE.—This account of the fighting in Transcaspia is compiled mainly from official documents, supplemented by one or two private letters. Any opinions expressed in the course of the narrative are those of the author himself, who, it may be said, does not belong to the Indian Army.]

THE fighting in the Transcaspian and Turkoman District, on the northern frontier of Persia, and round Merv, that followed the Russian Revolution, has attracted very little attention in England, but, though the number of our troops engaged was but small and the district remote from the principal theatres of war, the result was of great importance in itself, and particularly so to the Indian Empire, and it served to show once again the magnificent courage and endurance of the troops of the Indian Army.

By the summer of 1918 the Bolshevist movement had spread throughout Central Asia, and the whole of Transcaspia was completely under the domination of Lenin and Trotsky, the headquarters of the local government being at Tashkend. The nomad Turkomans themselves certainly rejected Bolshevism with almost complete unanimity, but it was accepted with enthusiasm by the majority of the Russian settlers. This condition of affairs was viewed with considerable apprehension by the Government of India, for in addition to the danger to Persia, the line of railway that runs along the Persian frontier from Krasnovodsk, on the Caspian Sea, to Merv, and thence by Chaqui, on the Oxus, to Tashkend, has a branch line running from Merv to Kusht, on the Afghan border. This line was originally made by the Russian Government for the express purpose of facilitating a possible invasion of India through Afghanistan, and it was evident that a large Bolshevist force concentrated there, and aided, as it was sure to be, by a liberal supply of German money, might be the cause of very serious trouble. Fortunately the Bolshevism of the Russian settlers was of a very mild type. So much so that a special emissary was sent from Tashkend to stiffen their zeal in the cause. This, however, actually brought about the downfall of the Bolshevist Government in Transcaspia, for this strange missionary, Frolov by name, displayed such autocratic brutality that he brought about a general reaction which resulted in the death of both himself and his wife at the hands of some workmen on the railway, in consequence of his having murdered five of them in cold blood with his revolver on some trifling disagreement. Frolov's death was followed by a general revolt,

and, with the aid of the Turkomans, the Bolshevist Government was expelled from Krasnovodsk, Askabad, and Merv, their troops being driven back to the line of the Oxus. At the end of July, 1918, large reinforcements arrived from Tashkend, which not only recaptured the Merv oasis, but threatened to reconquer the whole of Transcaspia, including Askabad and Krasnovodsk. The Provisional Government then appealed to India for help, and a small force was sent from Quetta to their assistance. The first of the troops to arrive was a machine-gun section (two guns) of the 19th Punjabis, which joined the Russian Volunteers at Bairam Ali, near Merv, early in August. On the 13th of the month the post was attacked in force, whereupon the Volunteers promptly retired by rail to Dushak, 100 miles away, leaving the unlucky Punjabis to their own devices. The Indians held out as long as they could, and finally retired with their guns to their own base at Mohamedabad, which place they succeeded in reaching with the loss of two men wounded, after being three days without food and having every single man down with influenza.

On August 20th a company of the 19th, with two more machine-guns, came in to Dushak, but as this place was not thought to be capable of defence it was evacuated and the troops moved to Kaaka. On the 26th the enemy made a reconnaissance in force, but retired in the evening to his trains, which were at Aiman Sugat, twelve miles from Kaaka. It is to be noticed that both sides used the railway for the movement of their troops, neither wishing to destroy it. On the same evening two more companies of the 19th came in together with two guns of the 178th F.A. Kaaka would have been a good defensive position had there been enough troops to fully occupy it, but as it was they were hopelessly insufficient, and this difficulty was made worse by the want of cavalry, for the Turkoman horsemen were of little use. To the north there was an extensive plateau that commanded the whole line, and the left flank of the position was practically left unguarded owing to the paucity of men.

On the evening of the 27th the enemy was reported to be detraining. At 7 a.m. on the morning of the 28th his attack opened by a bombardment by his guns, which had been placed on the plateau during the night. This was followed by a strong infantry attack on our left. A few of the Punjabis, who had been left in camp near the railway station on fatigue duties, were hastily collected, and these succeeded in holding the enemy until eleven o'clock, when they were reinforced by a company from the supports. The enemy was then driven off from the neighbourhood of the station after a sharp fight, leaving behind them four machine-guns which were brought in by the victorious Punjabis. The Bolshevists then gave it up and retired to their trains. The enemy's fire throughout was wild in the extreme and our loss was comparatively trifling, being five killed and twenty-seven wounded. Of these several appeared to have been shot from behind by, it was strongly suspected, some of the Transcaspian Volunteers, many of whom still retained their old Bolshevist proclivities. This combat showed clearly that the Volunteers could not be depended on, and that the Russian staff was hopelessly inefficient.

On the 29th a company of the 1/4th Hants came in, and on September 5th two guns of the 44th Battery, R.F.A., both detached from the troops in Persia. No further attempt was made by the enemy for a week, which was just as well, as there was another very severe outbreak of influenza among the British troops. The interval was used to put the place in as good a state of defence as our resources would allow of. The line was extended on the left, the defence of that, the most exposed part, taken over by the British, the guns of the 44th Battery were placed on a hill commanding the plateau, one company was posted in support of the Russians who occupied the centre and right, and two were placed in general reserve.

On the morning of September 11th the enemy attempted to repeat his operation of the 28th by combining a frontal attack on the left with a turning movement on the flank, bringing ten guns into action which bombarded the whole position indiscriminately without causing any casualties whatever. His infantry, however, could not be got to face our fire at close quarters, and at last made a hurried retreat, abandoning three of the guns. Had a pursuit been possible this retreat would no doubt have become a rout, and probably the whole of the enemy's force destroyed before it could have been entrained; but the Turkomans refused to move, and, as there was no other cavalry, the opportunity was perforce lost. With the exception of occasional firing from armoured trains nothing serious in the way of fighting occurred until September 18th, when the enemy again put in an appearance. The attack was made on much the same lines as that of the 11th, but this time a mounted force succeeded in working round behind the position and destroyed a small portion of the railway line. The enemy brought fifteen guns into action and wasted a vast amount of ammunition in a general bombardment that lasted the whole day. Several shells burst in and about the station, which was considerably damaged, but no serious infantry attack was made, and as the Transcaspian troops, as usual, refused to move, there was no counter-attack. Our casualties were two men wounded.

On September 28th two squadrons of the 28th Light Cavalry (Indian Army) came in. During this period the enemy's base was at Dushak, twenty miles from Kaaka. His strength probably amounted to about 1,000 infantry, 200 cavalry, and some sixteen to twenty field guns of various sizes, with a great number of machine-guns. He used about twenty trains, and possessed, in addition, two armoured trains armed with guns much superior to those that we had. There was a large force in reserve somewhere, but its strength could not be ascertained.

As to our own force, as far as the local levies were concerned, the number was very uncertain, as the men apparently joined and left just as they pleased. The Russians had about 1,000 foot and fifty mounted men, mostly Armenians, but of the first certainly not more than 100 could be depended on; four machine-guns, very badly manned; seven field guns, of which three were obsolete; and two small armoured trains, very inferior to those of the enemy. The artillery was fairly efficient. The British troops, at the end of

September, consisted of 280 cavalry, two field guns, and 550 infantry. The air service was uncertain. Sometimes we had an airplane, sometimes the enemy had one. The Turkoman horsemen were an unknown quantity, and could hardly count as cavalry. They were useless as fighting men, but proved super-excellent at looting and the massacre of unarmed fugitives. On October 1st a new Russian Chief of the Staff came in. He proved to be a very capable officer, and was able to introduce some degree of order into his motley levies, and, as the enemy made no signs of making another attack, it was decided to make an advance on our own side.

On the night of the 9th the advance commenced by a move on Aiman Sugat with the intention of seizing the enemy's trains, which were reported to be there. The trains, however, were not at this place, so a further move to Dushak was ordered, but the Russians refused to march on the ground that they had no food. The 28th Cavalry, who had been sent to attack Dushak from the south, were in consequence recalled. On the 12th the cavalry were sent out again, and this time the advance really did begin. At dawn the attack was commenced by three companies of the Punjabis. The ground was devoid of cover, being quite flat, and the Indians were met with a very heavy artillery and machine-gun fire. Nevertheless, they came on with great determination and captured the railway station with a rush. During the attack the Russians and Turkomans regarded the action seemingly as disinterested spectators. Meanwhile our guns had been busy shelling the station, and succeeded in blowing up one of the armoured trucks, the station itself being entirely destroyed.

The enemy then bolted precipitately and fled to the hills, pursued by the 28th, who killed many of them with their lances.

The Turkomans, seeing that the fighting had ceased, now swooped down on the railway station and the neighbouring buildings. Here they killed without mercy every Bolshevist that they found alive, including the wretched remnants of the crew of the destroyed train who had survived the explosion. They then thoroughly looted the place, carrying off everything movable. As every one of the white officers of the Punjabis had been either killed or wounded in the attack there was no one present to interfere with them, the Indians themselves naturally regarding their proceedings with indifference. A number of the enemy's trains were drawn up on the line about three miles from the station, to the west, and a considerable force now detrained from these with the evident intention of making a counter-attack. This move had been foreseen, and some of the Transcaspian troops had been specially detailed to guard against it. But these, as usual, could not be induced to move. At the same time another attack was threatened from the east by the enemy's reserve. As it was now evident that no assistance could be expected, either from the Russians or the Turkomans, and the Punjabis had suffered severely in their attack, a general retirement was ordered. This was effected in good order, covered by the guns and cavalry. The troops halted at Aiman Sugat for the night, and the next day returned to Kaaka.

The Punjabis, who displayed their usual courage and determination, suffered somewhat severely in this action, losing one British,

two Indian officers, and forty-five rank and file killed, and three British and one Indian officer and 146 rank and file wounded. The 28th had six killed and twelve wounded. The Russians returned their losses at thirty killed and wounded.

The losses of the enemy were very severe, amounting, from the statements of prisoners subsequently captured, to fully 1,000 men, for the fighting had been sharp while it lasted, and the Bolshevists had shown unusual spirit. There were few wounded, and no prisoners, the Turkomans having seen to that very effectually. At any rate, four days after the action the Bolshevists began a general retirement which was closely followed up by the Transcaspian troops. Dushak, Tejend, Merv, Bairam Ali, and Annenkovo were evacuated in succession, and at once occupied by the Allied forces without serious fighting, leaving the enemy's most forward post at Rovnina, the next station on the Central Asian Railway beyond Annenkovo, and, with the exception of occasional mutual bombardments by the respective armoured trains, no further military operations were undertaken by either side until January, 1919.

During this period there was another outbreak of influenza, the British troops, especially, suffering very severely.

On November 29th Brigadier-General Beatty arrived and took over the command of the British troops from Lieut.-Colonel Knollys. General Beatty had served for over three years in Belgium and France in command of the 9th Hodson's Horse, Indian Army. He had been given a D.S.O. and the command of a cavalry brigade in recognition of his services at the second battle of Cambrai, and after the Indian troops had been removed from France he was sent to take over the command of all the British troops in advance of and in Meshed. The whole of the forces operating in N.E. Persia and Transcaspia were, however, under the supreme direction of General Malleson, who was the Political Officer for the Government of India.

When General Beatty assumed command the numbers and distribution of his forces was as follows:—

At Askabad, on the extreme left—
200 men of the Warwickshire Regiment.
1 squadron of the 28th Light Cavalry.
50 men of the 19th Punjabis.

At Merv—
90 men of the Hampshire Regiment.
2 troops of the 28th Light Cavalry.

At Bairam Ali—
300 men of the 19th Punjabis.
2 18-pounder guns, 44th R.F.A.
1 squadron 28th Light Cavalry.

At Annenkovo—
150 men, 19th Punjabis.
2 troops 28th Light Cavalry.
2 Russian armoured trains, each armed with one 3-inch Q.F. gun. These were manned by the volunteer Russian ex-officers.

Thus there were two guns and about 1,500 men detailed to cover a line of front extending from Bairam Ali on the right to the Caspian Sea on the left, a distance of 500 miles, with a numerous enemy concentrating within striking distance of the extreme right, and in the midst of a discontented and unruly, if not actually hostile, population.

It is true that there were also the troops of the Provisional Transcaspian Government, but these, with the exception perhaps of the so-called Meshed Volunteers,[1] had been repeatedly proved to be utterly useless for either attack or defence. The utmost that could be hoped from them was that they might be found loyal enough to keep the population in some sort of order.

The troops in advance of Meshed were dependent on the Transcaspian Government at Askabad for supplies. The line of communications ended at Meshed, over 1,000 miles distant from Quetta, which was the actual base.

Outside the two oases of Tejend and Merv the country east of Dushak is a desert of low, sandy hillocks. Each of the two oases forms an irregular ellipse with a diameter of from fifty to sixty miles. The cultivation of these places is entirely dependent on the irrigation canals, of which there are immense numbers. The canals are supplied with water, at Tejend by the Tejend River, and at Merv by the Murghab. These streams have their rise in the mountainous country near Herat, and, after a course of some 300 miles, come to an abrupt end at Tejend and Merv respectively, the whole of their water being distributed through innumerable irrigation channels and absorbed by the thirsty soil.

Merv itself is a comparatively new town, the greater part having been built after the Russian occupation. The original town, of which only ruins now remain, was at what is now called Bairam Ali, some eighteen miles to the north-east. New Merv is situated on the Murghab, here a sluggish muddy stream. It has a considerable trade in carpets and other merchandise, and has a weekly market. There are large barracks, and a branch line from the Central Asian Railway runs from Merv station to Kushk, on the frontier of Afghanistan.

Bairam Ali is on the edge of the oasis about eighteen miles distant from Merv to the north-east. The late Czar had a large estate here, and a fine palace. The estate is irrigated by the water from the Murghab River, the canal and irrigation works being very extensive, comprising an electric power station fully up to date. Much cotton, of excellent quality, is grown here, and there is a large ginning factory and a scientific laboratory with all the latest appliances. Near the town is the celebrated mosque of Sultan Sunjar, and a camp of Alexander the Great. There is also a fine church, of which the dome, spire, and crosses are said to be covered with plates of pure gold.

Tejend resembles Merv in most particulars, but the town itself is small and unimportant.

[1] There were now about seventy of these, for the most part ex-Russian officers. They had been trained as mounted infantry at Meshed.

Askabad, on the Central Asian Railway, is the capital and seat of the Transcaspian Government. Here there is a large military cantonment with fine stone-built barracks sufficient to accommodate an army corps. From Askabad an excellent road runs right into Persia, made by the Russians. The city is well laid out and contains some really fine buildings. Askabad is about 250 miles distant from Merv, being connected with that place by the Central Asian Railway, and some 250 miles from the Caspian Sea.

Apart from the Russian settlers, the inhabitants of the country are Turkomans, with a small admixture of Armenians.

Kaaka and Dushak are stations on the Central Asian Railway between Askabad and Tejend.

As the enemy showed no signs of recommencing hostilities after his disastrous defeat at Dushak, the month of December was occupied in reorganizing the whole force and in establishing supply depôts, the line of communications being extended to Askabad. Towards the end of the month, however, disquieting rumours began to be heard of the concentration of a large hostile force at Charjui, on the Oxus River, a place on the Central Asian Railway about 140 miles north-east of Merv. These rumours caused a renewal of unrest among the Russian settlers, and finally it was decided to disarm the whole of the inhabitants in and around Merv and Askabad. Had the enemy's new army been merely composed of Russian Bolshevists, this threat to Bairam Ali and Merv might have been regarded with comparative indifference, their fighting qualities having already been shown to be of the lowest class, but it was now reported that the Bolshevist forces had been stiffened by a large number of Austrian prisoners of war, whom they had released and armed. These men, who had been interned in various remote places, were entirely ignorant of the disasters that had befallen the Central Powers in the West. They were told that the Germans were in possession of Krasnovodsk, on the Caspian, and assured that, if they were able to reach this place, they would certainly be sent home by way of Astrakhan.

The concentration of a force estimated at something like 5,000 men, well armed and provided with an efficient artillery, within striking distance of his extreme right flank, which his orders forbade him to reinforce from another part of his line, was inevitably a source of the greatest anxiety to General Beatty, who knew well enough that he could not rely in the least upon his Transcaspian allies for any efficient assistance. To attempt to defend Merv itself with the force available was hopeless; and the irrigation canals that surrounded the town entirely prevented the use of cavalry. Bairam Ali presented similar difficulties. There, too, was an intricate network of canals and ditches, and no position from which the infantry could cover the town from attack. The only line of defence there consisted of a dry canal running north and south across the railway. This had a light wire fence in front and a good field of fire, but both flanks were in the air, and there was nothing whatever to prevent the enemy from turning

either or both, and the canals made the rear of the position impassable to cavalry.

Under these circumstances it was decided to select a position somewhere well in front of Bairam Ali. The Russian staff, now fairly efficient, recommended a place well out in the desert, six miles north-east of Annenkovo[1] station, covering the railway, and, after inspecting the ground, General Beatty agreed with them.

The position fixed upon was a line of low sand hills running parallel to the railway and on the north-west of it. The line here takes a bend to the north, and the sand hills afforded some protection from view and cover from the fire of the enemy's armoured trains, which were stationed about three miles further up the line. Here, then, the Russian Staff disposed all their available force, namely, the two small armoured trains, 400 Turkoman horse, 100 infantry (Armenians), and the Meshed detachment. They were now strengthened by one company of the Punjabis and two troops of the 28th Light Cavalry.

The information obtained by the Russian Staff led them to believe that the Bolshevists had completed their preparations, and that an attack might be made at any time, but it was not until January 16th that it took place. The night had been bitterly cold—so severe indeed that prisoners subsequently captured by the patrols stated that the enemy had something like 500 cases of frostbite in consequence, and on the morning of the 16th there was a thick, frosty fog which lasted the whole day. The usual patrols were sent out by the 28th to the north-east at daybreak, 6 a.m., and those of the Russians to the north-west. These returned at 8.30 and reported that they had seen no signs of the enemy; but at 8.50 two loud explosions were heard behind the line. Patrols were at once sent in the direction of Annenkovo station, and reported that the line had been blown up in two places, on each side of the station, and the telegraph wires cut, while another patrol sent in word that it had seen and been fired on by four squadrons of the enemy three miles to the north-west. Immediately afterwards a Russian patrol brought in a prisoner who stated that the enemy were advancing with the intention of attacking the left of the position. The fog still continued as thick as ever, effectually hiding the movements of the Bolshevists, but it was by this time evident that an attack really was about to take place. A working train with repairing party was sent off at once to repair the broken line. By 10 a.m. communication was restored. The troops at Bairam Ali were then warned, and one company of the Punjabis, which, as it happened was already paraded to relieve the company at Annenkovo, was at once entrained and sent off. A fresh report then came in to say that the enemy's infantry had been located three miles north-west of Annenkovo, and a squadron of the 28th was ordered to entrain and move to the front. The squadron at Merv was also ordered up, together with the remaining troops at Bairam Ali, leaving only fifty

[1] Annenkovo is thirty miles from Bairam Ali.

infantry and twenty lancers in the town to keep order. The enemy's exact movements were still uncertain. It was afterwards ascertained that the enemy, both cavalry and infantry, had made a wide circuit to the west from Rovnina, the cavalry continuing their course to Annenkovo, and the infantry breaking off to the east to concentrate for the frontal attack. After destroying the railway the cavalry returned on a smaller half-circle, crossed the railway three miles to the north of the position, and joined the force detailed for the attack of the right flank which had come down the railway from Rovnina. At midday a message was received from the Russian Staff saying that a Bolshevist, one of the released prisoners, had been caught, and that this man, a German, had been induced—how, it is perhaps as well not to inquire into too closely—to disclose the whole plan of the impending attack. This was as follows: Demolition parties, protected by 400 cavalry, were to raid communications in order to prevent reinforcements coming up, to prevent armoured trains from getting back to Bairam Ali, and generally to interrupt communications from front to rear. Twenty train loads of troops were brought to Rovnina. The main attack, with 2,500 men, of whom 1,000 were released German and Austrian prisoners, was to attack and envelop the British left flank; at the same time a simultaneous subsidiary attack was to be made on the right front by 1,500 infantry. This was to be supported by eight field guns, the cavalry, and the machine-guns. These attacks were intended to be a surprise and to commence together when the railway was broken up. The general objectives were to seize and capture all trains, to destroy the force holding the Annenkovo position, to advance and seize Merv by surrounding the town, neglecting Bairam Ali for the time, and then to advance to Askabad and Krasnovodsk. Camels carrying three days' provisions for the army were loaded up and ready to move.

The accuracy of this statement was fully borne out by the actual attack. It was a pretty plan of operations, and might very well have been accomplished had not the preliminary part of it been spoilt by the obstinate valour of the Indian soldier.

Up to this time none of the troops ordered up from Bairam Ali had arrived at the front. The armoured trains were drawn up just south of the bend in the line previously mentioned; the company of the Punjabis under command of Captain Pigot were deployed parallel to the railway to the west of the trains; the seventy men of the Meshed company were posted on their left; and a little in advance of the left were the 100 Armenians. The right flank was covered by the two troops of the 28th, with two Hotchkiss guns, and the Turkoman horsemen.

At 12.30 p.m. the Armenians were ordered to advance, and at once came in touch with the infantry of the enemy, and at the same time eight field guns opened fire from a low range of sand hills about 3,000 yards from the right centre. The Armenians, who were greatly outnumbered, were forced to retire, though they fought better than might have been expected from their previous performances. The

enemy now extended his line so as to overlap the left, and a platoon of the 19th was sent to the help of the Armenians, but as the enemy continued to bring up fresh troops, and the Armenians came under a heavy enfilade fire of machine-guns, these gave it up and retired from the fight altogether.

The Meshed company took the place of the Armenians, but the enemy continued to press his attack, continuing to bring up fresh troops, and extending his line until he threatened to completely overlap and outflank the whole position, and the situation was very critical. Fortunately just at this moment the first train bringing reinforcements arrived. This train brought Major Drummond's company of the 19th. The train came on right into a heavy machine-gun fire, and the men, jumping out of the carriages, formed line at once and attacked the flank of the advancing enemy. The Bolshevists held their ground until the Punjabis were within 150 yards of them, when they broke and fled in disorder, being heavily punished as they crossed the front of the original line. This spirited little combat lasted about five hours.

Meanwhile the enemy had pressed the subsidiary attack on the right with some 1,500 infantry and three squadrons of cavalry. Fortunately this attack began some time later than the main attack. Indeed, if the destruction of the railway and the two attacks had been effected together in accordance with the plan of operations, the enemy would very probably have destroyed the whole of the defence at one blow. The fog no doubt delayed his concentrations. Though the two troops of the 28th and the Turkoman horse kept the enemy at bay for some hours, by about 5 p.m. they had gradually been forced back. One of the armoured trains was surrounded, but the crew of the car, all ex-Russian officers, jumped out and attacked in their turn with such vigour, just as a platoon of the 19th came up to assist them, that the enemy were held up. It was at this juncture that the main attack failed, and the defeated troops were seen in full flight across the desert. The panic spread to the others, who beat a rapid retreat in their turn, and the action came to an end.

The Meshed Russians and some of the Turkomans followed up the retreating enemy for some distance, but were not able to effect much before nightfall. Seven machine-guns were taken, but the enemy got his artillery away safely. It was most unfortunate that the Squadron of the 28th sent from Bairam Ali did not arrive in time to take part in the pursuit. It seemed that the enemy's cavalry had been able to again destroy part of the line, and though this was promptly repaired the train did not come in until it was too dark to do anything. The half-squadron from Merv came in by train at 1 a.m., and thirty-five lances from Bairam Ali, who had marched by road, at 4 a.m. the next day.

The losses of the Punjabis were extraordinarily small considering the duration and severity of the combat, and showed not only good fighting, but good leading and good shooting; 182 dead bodies were picked up in front of their position the next morning, whereas their own casualties amounted to but one native officer and eleven men

killed and thirty-six wounded. Prisoners taken some days after the fight stated that the total loss of the Bolshevists was 560 killed and wounded, exclusive of missing. This other information corroborated, and it may be taken as correct.

Thus this handful of Indian soldiers, ably commanded and well led, utterly defeated a force of over 4,000 European troops supported by eight guns, and effectually saved the whole of Transcaspia from the hateful tyranny of Bolshevism; for this check so disheartened the Bolshevist troops that they could not be induced to make another attack during the British occupation.

From January 15th the British forces were transferred to the Constantinople command.

Though there was no further serious fighting, frequent encounters took place between the cavalry patrols of the two armies. These, though in themselves but trifling affairs, sometimes gave the troopers of the 28th an opportunity to show their courage and enterprise. The following is an account of one of these:—On the morning of March 2nd, 1919, a patrol of the 28th, commanded by L/Dafadar Manawar Khan, was on its way to its appointed destination when one of the scouts reported that he had sighted five of the enemy's cavalry. The ground, it may be said, was the usual sandy desert and low hillocks covered with scrubby bushes, affording good cover for a surprise attack. The patrol commander halted his patrol, and, having verified the scout's statement, advanced cautiously towards the enemy. Immediately afterwards two bodies of hostile cavalry, each about fifty strong, came into view, converging on the patrol from each side of it. The patrol made at full speed for the gap between them, but this was immediately closed by a third party of the enemy that had been echeloned behind the first two. The patrol then split up into two sections and charged half-right and half-left. The enemy fired a volley from their horses, and dropped two of the lancers, wounding also several horses. A general melée then followed, the Indians using their lances with great effect. The trumpeter used his sword and pistol, and those of the men whose horses had been shot their rifles. One Sowar killed three of the enemy with his lance, but was unable to withdraw the weapon from the body of the third, and got a severe sabre cut on his arm while trying to extricate it. Many of the patrol accounted for two each, and altogether twenty-one of the enemy were accounted for, of whom seventeen were killed by the lance, one sabred, and three shot. After breaking through the enemy the men scattered, but they all got back to camp during the night and the following day, except three, of whom two were known to have been killed at the beginning of the fight.

On another occasion a patrol of seven men encountered a squadron forty strong. The patrol charged at once and scattered the enemy completely, killing two of them.

Both these encounters are good examples of what can be accomplished by bold and resolute horsemen.

In March it was decided to evacuate Transcaspia, as the Russian Command in the Caucasus intimated its readiness to send troops there. The Government probably foresaw that complications might arise with Russia if a settled government was established there, and was therefore desirous of removing the troops as soon as it could be done safely. Early in March a large force of Russian volunteers, air-planes, guns, rifles, and ammunition arrived from the Caucasus. The troops under General Beatty were all withdrawn to Bairam Ali on March 15th, and shortly afterwards Transcaspia was finally evacuated.

SOME DISPUTED POINTS WITH REGARD TO THE EVENTS OF THE GREAT WAR OF 1914-18.

By Major T. E. Compton.

I.—The French Plan of Campaign.
II.—The Abandonment of the Briey Ironfields.
III.—Salonica.
IV.—Suvla Bay.
V.—Kut.
VI.—Von Kluck's Change of Direction before the Battle of the Marne.

The French Plan of Campaign in 1914.

IT is generally a rather distressing exercise for military men who have spent perhaps forty years or more of their lives in the study and practice of their profession, to have to read an account of military operations by a civilian. Yet more often than not it is the only source of information available, and so long as the writer refrains from indulging in dogmatic appreciations and sweeping criticisms, especially adverse criticism of distinguished living generals, and contents himself with recording the facts and describing the nature of the theatre, his work may be of much interest, and even of the very greatest value.

There are several good French civilian writers on military operations. M. Bidou, in the *Journal des Débats,* and M. Joseph Reinach (Polybe), in the *Figaro,* both did valuable work during the war. Nevertheless, when an *interim writer*—evidently a soldier—took M. Bidou's place for a week a change for the better (from a purely professional point of view, of course) was at once noticeable. But whether the soldier could have gone on writing, supposing him to have had the time, day after day, with equal excellence as M. Bidou did, is another matter. M. Gabriel Hanotaux, the Academician and former minister, is another brilliant writer on military operations, whose style is most agreeable, even when his conclusions are open to objection.[1] His "*Histoire de la Guerre de* 1914," and his articles in the *Revue des Deux Mondes* in 1916, threw much light on the French plan of campaign, until then regarded, generally, as a complete enigma.

In 1918 another prominent man, M. Fernand Eugeraud, Deputy for Calvados in the French Chamber, took up the matter in the *Correspondant* Magazine. As M. Eugeraud is a member of the Catholic-Monarchist Right, and in consequence a political opponent

[1] M. Hanotaux's description of the Battle of the Trouée de Charmes produced a spirited reply in *La Revue* by an officer who had been apparently on the Staff of the First Army, who directly traversed some of his conclusions.

of all the republican parties, he, no doubt unconsciously, at once introduced a marked controversial element into the discussion. In fact, these articles, now published, with others on the political prelude to the war, as a book at 15 francs, constitute—although the author disclaims it—a vigorous indictment of the French republican governments for abandoning the defences of the northern frontier, and of Marshal Joffre for both the adoption of an offensive plan and for its execution.

These articles appeared at a most unfortunate time for polemical writing on military matters; namely, in March, April, and May of 1918, and since then it has been generally thought premature to raise a controversy of this sort before the principal actors have leisure to explain the reasons for their dispositions and to reply—if they think it worth while—to criticism.

Nevertheless, the wisdom of the French plan of campaign, both in its nature and in its direction, is certainly open to argument, while its execution was an undoubted failure.

When all the facts are known, however, the verdict of history is likely to be in favour of Marshal Joffre, or will at least exonerate him from unwisdom and rashness in his plan of campaign for reasons indicated in the following brief appreciation.

M. Eugeraud asserts, in very dogmatic fashion, that to avoid disaster at the outset, a rigorous defensive was a strategical necessity, both on account of the configuration of the frontier and the state of preparedness of the German Armies.

Although he writes after the event, we must do him the justice of accepting his statement that he has all along been an advocate, together with the lamented Colonel Driant, another Catholic deputy and son-in-law of General Boulanger, of the preparation for defence of the northern frontier, and he quite rightly points out that it was the abandonment of the defences in 1900 that made the violation of Belgian neutrality a certainty.

His thesis is, however, vitiated by two weaknesses. He adopts as his alternative defensive plan, General de Rivière's scheme of 1885, thirty years old, when the conditions of armament and, above all, of numbers of trained men available on mobilization, were very different from what they were in August, 1914. Secondly, he takes no account of the immense advantage to an army of the offensive spirit, apart altogether from the value of seizing the initiative, which an offensive plan of campaign implies.

Moreover, in all the great wars of the previous sixty years, the offensive had triumphed both strategically and tactically. The Crimea, 1859 in Italy, 1866 in Bohemia, 1870-71 in France, 1877 in European Turkey, and the Manchurian campaign of 1904-5, had all been conducted by the victor on an offensive plan, while the Battles of the Alma, Solferino, Königgrätz, all the battles of 1870, and all those of the Manchurian campaign, except perhaps the Shaho, had been won by the army adopting a tactical offensive.

There were good reasons, therefore, why the French Staff should have turned away from de Rivière's defensive plan of 1885, and

reverted once more to the methods of the great Napoleon.[1] It may even be said that they were justified by the event, despite the reverses on the frontier, and that it was the offensive spirit of the French, inculcated in time of peace, that enabled them to attack the astonished Germans again in grand style, within a fortnight of Charleroi and the Ardennes, and win the Battle of the Marne; and for four years afterwards to attack again and again, until finally, with their Allies the British—equally partisans of the offensive—they swept all before them to the most complete and decisive victory won in Europe since Waterloo. It may be reasonably doubted whether troops trained under de Rivière's scheme of, practically, passive defence, would have had the same spirit.

Broadly stated, this plan, which has so much taken M. Eugeraud's fancy, was, in addition to the fortifications of the eastern frontier, to fortify the space between the fortresses of Maubeuge and Lille, but utilizing the rivers to form a system of inundations, and generally to render this part of the northern frontier impregnable, with an entrenched camp at Lille capable of holding a large army to protect the left flank and operate as occasion offered; while the part left open east of Maubeuge was to be closed, in second line, by a fortified position on the hilly ground on the front Laon—La Fère—Rheims, where the great battle was to be fought. The enemy repulsed, was then to be driven back over the frontier by a counter-offensive.

This plan would have certainly presented greater obstacles to the enemy's advance in 1914 than was actually the case; but in view of the numbers and the *matériel* that the Germans brought into the field compared with the French *matériel* available, so far from possessing that absolute perfection that M. Eugeraud would apparently claim for it, it is at least conceivable that this plan would have ended by placing the Allies in a worse position than they were in after the Battle of the Marne. Hindenburg's astonishing successes in East Prussia would have given the enemy plenty of time to conduct his operations with deliberation, while the offensive spirit of both Allies and Belgians would have suffered.

As to Marshal Joffre's responsibility, the fortifications of the northern frontier had, as before mentioned, been abandoned years before he became Chief of the Staff, and an offensive plan was *de rigueur*.

The situation presented to him in 1914 was as follows:—The war was about to be carried on on two fronts.

On the Eastern Front, Russia would be ready to invade East Prussia on August 20th with a force of about twelve army corps and two or three cavalry divisions.

In these circumstances it was calculated, according to M. Hanotaux, that the French would have a superiority of numbers, to begin with, on the Western Front.

Until Germany showed her hand, the policy of the French Government was to respect most carefully the neutrality of Belgium. In

[1] The only time that Napoleon was really on the defensive was at Leipsic, a battle fought against his wish. His plan would have been quite a different one; but indiscipline in his Army forced him to retreat on Leipsic.

consequence the concentration of the French Armies, on mobilization, had to be on the eastern frontier.

The possibility of the enemy's violation of Belgian neutrality had, however, to be kept in view, and a plan prepared to meet this contingency. The French were to advance on August 20th and attack the Germans in Belgian Luxembourg (the Ardennes), while the strong French Fifth Army, of twelve divisions, in conjunction with the British Expeditionary Force, was to deal with the enemy on the left bank of the Meuse (in Belgium), pivoting the right flank on the fortress of Namur.

The French Staff miscalculated the strength of the German forces opposed to them by about nine army corps, which fact, combined with the gain of time by the Germans in mobilization, which could not be helped, although it might have been foreseen, accounts for the failure of Marshal Joffre's offensive plan of campaign. Both on the Sambre and in the Ardennes the Germans were in superior force and in superior readiness. Having the diplomatic initiative and declaring war they gained two or three days on the French in mobilizing. As to their strength, they appear to have been quite unaware of the advanced state of the Russian preparations or for the invasion of East Prussia, and left only four corps of the active Army on the Eastern Front for the defence of that province.

From a purely military point of view it would have been sound strategy on the part of the Germans to have allowed East Prussia to be temporarily overrun in order to bring superiority of strength against the French; but its effect on public opinion in Germany obliged them in the actual event to send back two army corps and a cavalry division after the first battles in Belgium. Had the Great General Staff credited the possibility of the dilatory Russians being ready in such force by August 20th, the distribution of their army corps on the two fronts would in all probability have been more as the French Staff reckoned. The Germans, also, had more reserve corps ready on mobilization than was expected.

The French plan was boldly conceived. Space forbids any attempt to criticize its execution in detail. It failed for two reasons: the enemy on his side was ready to advance to the attack before the Allied offensive could be developed, and secondly, instead of seven corps on each side of the Meuse, as it was thought would be the enemy's strength, the enemy had on the right bank thirteen and on the left ten.

After the foregoing lines had been written, a long and extremely interesting article by M. Hanotaux, inspired by and partly in answer to M. Eugeraud's criticizms, appeared in the *Revue des Deux Mondes*.[1]

M. Hanotaux's information—which, as that of a former minister and member of the *Académie Française* (Marshal Joffre being now also a member), should be of the very best—entirely confirms what had here been set down with regard to the French plan of campaign. For many years before 1914, the offensive, in case of war with Germany, had been the settled policy of the French Governments, and the fact

[1] March 15th, 1919.

has been quite recently fully admitted in the Chamber of Deputies by a former War Minister, M. Etienne, in the course of the Briey debate.

Marshal Joffre, therefore, did not originate the offensive policy, although in accepting the appointment of Chief of the Staff in peace, and *ex-officio* Commander-in-Chief in war, he, of course, assented to it.

It is highly probable, also, that it was the same with the actual plan of campaign, which in its main lines would naturally have been worked out and settled by the General Staff at the time when the offensive policy was adopted, after which it would only have been necessary to keep it up to date. What determined the offensive policy, according to M. Hanotaux, was a calculation by the General Staff that the French could mobilize and concentrate more quickly than the Germans. Doubtless their calculation was correct, but what they failed to allow for was what actually occurred. Germany, being certainly the aggressor, obtained a good start in her mobilization before the actual declaration of war, by confidential orders and by such devices as declaring the country in a state of danger of war.

The failure in execution of the French plan was due in great measure to this cause, which perhaps should be put down as a fault on the part of the French Staff. It was also due to a misappreciation on the part of the French Staff and French Commander-in-Chief as to what would be the enemy's plan.

The French plan was based on the assumption that the German violation of Belgian neutrality (which was expected) would take the form of an advance on the right bank of the Meuse through the Belgian Ardennes. The invasion and occupation of the whole of Belgium did not enter, apparently, into the French appreciation of the situation.

M. Hanotaux admits that the German advance in force on the left bank of the Meuse surprised the French Staff.

The French intended to attack the Germans in the Belgian Ardennes with three armies. The appearance of the enemy in force on the left bank of the Meuse obliged the displacement and despatch to the Sambre of the strong Fifth Army.

The central mass of manœuvre was thus suddenly reduced by one-third when about to advance across the frontier. It is easy to see, from the fact that the Fifth Army did not receive orders to move till August 15th (date of German attack on Dinant), how the French Staff clung to the last moment to their original conception of what the enemy's plan would be.

The Briey Ironfield.

The Briey is a question that has been greatly debated both in the Press and in Parliament, and while the reasons for the abandonment of this Lorraine ironfield at the beginning of the war to peaceful exploitation by the enemy have been thrashed out, its exact value is still disputed. According to M. Meerheim, the syndicalist leader of the metal workers and one of the foremost men of the French Labour movement, who inspired some articles on the Briey ironfields in the

Temps, the Germans depended for the manufacture of their war material mainly on Swedish ironfields, and only a minimum proportion of their total requirements came from Briey.

This is not, however, what the Germans say themselves; but M. Meerheim's object, so he says, in inspiring these articles was to prevent the enormous losses which an attempt to capture Briey would have involved, which would have been more than Briey was worth.

The French Staff, however, never had any intention of attacking the fields, for reasons that will be given later.

Both in 1916 and 1917, the Committee of the Association of all the great iron and steel manufacturers of the German Empire addressed a memorandum to the Chancellor, stating in 1916 that "the Lorraine ironfields cover from 60 to 80 per cent. of the fabrication of iron and steel, and if the production from these mines is seriously checked the war will be lost."

In 1917 the *Memoire* fixed the peace-time production at 60 to 68 per cent. of the German requirements. It was the deputy already mentioned in connection with his criticizms of the French plan of campaign, M. Fernand Eugeraud, who introduced the subject in the Chamber of Deputies on January 31st of this year, by vigorously attacking the French Staff and the French Government of August, 1914, of which M. Viviani was the chief, for not defending the *Bassin de Briey*.

M. Eugeraud's quotations from German official documents seem to settle affirmatively that part of the question in dispute as to whether the possession of Briey was, or was not, essential to the continuance of the war by Germany. But as regards its non-defence and freedom from attack either from the land or from the air for the first half of the war, the French Staff would appear to have a sufficient answer.

The Briey iron mines were partly in French and partly in German territory. How, therefore, with the range of modern guns, requiring the fortifications or fieldworks to be several miles in advance of the zone to be protected, was it possible to arrange for the defence of Briey?

Again, with regard to absence of attack from the air, M. Albert Thomas, Minister of Munitions, wanted soda from a neighbouring district for the manufacture of explosives. Freedom from aerial attack for these French works he regarded as vital, for many months, and it was at his desire and on his repeated representations that Briey was left in peace for fear of reprisals. An attack in this direction from Verdun was scarcely practicable, and would have been very costly.

M. Viviani excels as an orator, and on January 31st he was able to bring off a big success in this line by representing in glowing language the moral effect produced throughout the world, or great political advantage for France, by his order, on war being declared, to withdraw the French troops eight to ten kilometres from the frontier, manifesting in this way the nation's desire for peace and absence of all aggressive intention. He was also able to show that this order had nothing whatever to do with the abandonment of Briey, already decided on by the French Staff.

Doubtless, had it been possible to foresee the length of the war and the increased importance of heavy artillery, the works would have been destroyed and the mines damaged before abandonment; but at the time this valuable French property had to be left intact.

SALONICA.

From an Entente point of view, there is now no dispute about the wisdom or unwisdom of the Salonica Expedition. Events have proved it to have been right in a military sense as it was expedient for political reasons, although eminent critics—not all of whom hailed from Berlin—were fond of describing it, up to a year ago, as "Germany's best camp of concentration." It was justified at the time, on military grounds, owing to the great superiority of force in reserve on the Entente side that it then seemed certain would be eventually trained and made available in Russia and in Great Britain. The unexpected Russian defection jeopardized its success for the moment, but in the end it was not only successful on its own ground, but proved a valuable aid to final victory in the principal theatre.

The Salonica Expedition was conducted on right lines. It is a good example of a secondary effort, that could not well be neglected, carried out as Clausewitz said it should be invariably conducted. The main force of the Allies in the principal theatre was drawn on as little as possible. To begin with, more than half the expedition came from the Dardanelles, and towards the end the Serbs and Greeks furnished the largest contingents, while the Italians occupied Albania.

To M. Venizelos must be given most of the credit for the sound policy as for the brilliant success of the Salonica Expedition. His indomitable courage and far-seeing statesmanship triumphed over what at one time seemed almost unsuperable obstacles, so that in the end ten Greek divisions, well trained and well found, gave to General Franchet d'Esperey that superiority of numbers for which he had been waiting in order to assume the offensive, without drawing a man from the main theatre of operations in France.

A great and far-reaching victory settled once and for all, from an Entente point of view, any question of dispute about the wisdom of the Salonica Expedition.

There is, however, a disputed point on the German side with regard to this subsidiary campaign.

General von Winterfeld, who was on the Armistice Commission of Spa, and who before the war was Military Attaché at Paris, stated to French officers that one of the faults that lost Germany the war was not following up the occupation of Serbia, about Christmas, 1915, by a concentrated attack in force on the Salonica Expedition in Greek territory.

This is likely to remain a disputed point, for some time to come at least. The Germans are too much occupied at present with internal troubles to bother about academic questions of this kind. The General Staff may even be broken up. Von Falkenhayn was Chief of it in 1915, and the responsibility for respecting the neutrality of Greece,

as for the attack on Verdun, presumably falls upon him, for Hindenburg and Ludendorff at this time were on the Eastern Front operating against the Russians on the Dwina. Probably, at that time at least, it was considered politic not to allow the Bulgarian Army to enter Greek territory, and German divisions could not be spared with the attack on Verdun pending.

No reference has been made to the Dardanelles Expedition, as this question has been threshed bare in official reports and in the Press; but the opinion of General Liman von Sanders, who commanded the Turkish troops on the Gallipoli Peninsula (and subsequently in Palestine), on General Ian Hamilton's operations, and especially with regard to the abortive landing at Suvla Bay, is comparatively fresh criticizm of strategical interest as coming from the other side.

Suvla Bay.

Doubtless, the advantage that ought, or ought not, to have been anticipated from the landing at Suvla Bay is a disputed point with the friends of Generals Stopford and Hammersley; and possibly others, who know the facts, may not agree with Sir Ian Hamilton's censure of the manner—too deliberate for the occasion, whatever the difficulties—in which those officers appreciated and carried out their orders. There is also the point, much commented on at the time in the Press, as to what Sir Ian Hamilton ought to have done himself when, on the evening of this eventful day, he found everything at a standstill. He was the Commander-in-Chief, certainly, and surprise was the very essence of the manœuvre, demanding rapid and determined action. But for the very reason that he was the Generalissimo, he could hardly take actual command of a division himself, and with all the orders issued for the following morning, and the men tired and in bivouac for the night, the situation was such that even the renown and authority of a Wellington might have failed to vitalize it.

The fault, if any, lay in not appointing a young and energetic commander for an enterprise so supremely important. Possibly Sir Ian Hamilton is sorry now, in view of the Liman von Sanders admissions, that he did not for once throw precedent to the winds and assume for that evening the executive command of the troops himself.

As reported in *The Times* of November 20th, 1918, General Liman von Sanders stated, in an interview with Mr. G. Ward Price at Constantinople, that for the first twenty-four hours the only opposition to an advance the Suvla Bay force would have experienced was that forthcoming from two battalions of Turkish gendarmes, two squadrons, and two batteries of old guns.

Although, after that period, a division was hurried up from Bulair, he is of opinion that, had the British pushed on in several columns, they might have entrenched themselves in a position on the heights.

Kut.

The unfortunate advance on Baghdad in 1916, with inadequate forces, has been inquired into, reported and debated *ad nauseam*.

But the exact responsibility for permitting General Townshend to make this advance in insufficient strength, which was the root cause of the subsequent surrender of his forces in Kut, and of the terrible sufferings of the sick and wounded on the long line of communications during their transit to the base on the Persian Gulf, was never settled.

It was left a disputed point.

There were a good many people concerned, including the representative of the Indian Army on the Secretary of State's Council in London, the Commander-in-Chief in India, and the Indian Government. But virtually the responsibility was shared by three authorities: the Home Government, who wanted the advance made, if possible, and authorized it; the General Officer Commanding-in-Chief the Mesopotamia Expedition (Sir John Nixon); and General Townshend. An interesting correspondence on and in connection with this point, between Generals Nixon and Townshend, was published in the Blue Book; but, not unnaturally, they failed to agree on the question of responsibility. Briefly stated, the facts were as follows:—

On first reaching Kut, General Townshend reported that the Turkish troops recently met with were much superior to those previously encountered, and, in his opinion, he should be reinforced by an army corps before advancing on Baghdad.

General Townshend did not get the army corps he had said was required; but in course of the next three or four months he got part of it and went on.

After the disaster, General Nixon argued that, as General Townshend went on with the reinforcements he received, without making any further protest, he had, by so doing, taken the responsibility.

General Townshend's reply was to the effect that, having stated his requirements to the Commander-in-Chief, it was for the latter to take action as he thought proper. As he did not get the full army corps or fresh orders, he assumed that the Commander-in-Chief considered that the reinforcements sent him ought to be sufficient. In these circumstances, as the capture of Baghdad was generally desired, he thought it his duty to make the advance without further delay.

It is a nice point, although, doubtless, many will think that General Townshend was placed in a somewhat invidious position.

Von Kluck's Change of Direction before the Battle of the Marne.

In conclusion, it is now possible to settle this point conclusively: why a part of the German First Army—the right wing—which up to September had been marching in the direction of Paris, that is to say, south-south-west, suddenly marched east-south-east, across the northern front of the Paris entrenched camp, from the Oise to the Marne.

In the popular mind this is hardly a matter of dispute. Nine people out of ten, or even a larger proportion, still believe that von Kluck was marching on Paris with a view to attack it, and that for

some reason he changed his mind suddenly and, instead of attacking it, was attacked himself as he offered a flank in following on the tracks of the British Army.

Military critics, however, who knew the old von Moltke's plan for another invasion of France, and who remembered the Napoleonic principle that the first objective of a campaign should be the destruction of the enemy's army, doubted very much if the investment of Paris, or even an attack on this fortress, ever entered into the plan of the Great General Staff previous to the decisive defeat of the opposing armies.

Paris, it must not be forgotten, is a fortress, besides being the capital of France.

That the original plan of the German Staff for the first phase of the campaign did not include an attack on Paris is clear from the fact that in the maps issued to von Kluck's Army of Belgium and the north of France, Paris and Meaux did not appear in the area of operations, although the country east of Paris watered by the rivers Marne, Aube, and Seine did so appear.

This fact was established by M. Joseph Reinach, the Military Critic of the *Figaro* and former deputy, in an article that appeared in the *Revue de Paris* for April, 1917, the maps in question (preserved in the French War Office) being reproduced on a smaller scale.[1]

Field-Marshal von Moltke, the victor of 1866 and 1870, whose great nephew, General von Moltke, was Chief of the Great General Staff in 1914, had laid it down as a fundamental principle, in case of another war with France, that the French Armies must be decisively beaten and pursued, if necessary, even to the Loire, before attempting the siege, or investment, of Paris.

There is every reason to suppose, therefore—especially with the corroborative evidence of the maps—that the German plan in 1914 was in accordance with the Napoleonic rule, and that a serious attack on Paris was not contemplated till after the Allied Armies had been decisively defeated.

But certain conversational statements of General von Kluck, if correct as quoted by M. Hanotaux, put a somewhat different complexion on the German advance after Charleroi. It would seem that the Great General Staff never expected to meet the French in force in Belgium, and that the victories of Charleroi and the Ardennes may have appeared to them at first as more decisive than they really were. Of von Kluck's own view, if his conversation is correctly reported, there can be no doubt whatever. After Mons and Le Cateau, where he was only resisted by two army corps, whereas he had five, following on the victories, exaggerated no doubt in his own mind by his own success, of Charleroi and the Ardennes, he considered that the enemy had been decisively defeated and that an attack on Paris was already feasible. Pursuit of the routed enemy was, and remained, his one idea up to the time he was attacked himself in flank on September 5th.

[1] This article formed the basis of a paper contributed to the "United Service Magazine" in May or June, 1917, by the present writer, entitled "Von Kluck's Objective after Mons."

When, after the Battle of Guise (August 30th) and the French resistance on the Meuse, the Great General Staff became convinced that another great battle would have to be fought, they found it extremely difficult—indeed impossible—to restrain von Kluck.

According to M. Hanotaux, who follows the German writer Stegemann, it was the intention of the Great General Staff, when on September 1st it became clear that another great battle would have to be fought, to bring von Kluck's Army into second line. As both sides were pivoting on the Lorraine front, the Germans on the Moselle and the French on Verdun, it was evident that the battle must take place to the east of Paris. Without going into the question of the German plan of battle, it is sufficient to state here (although the actual order is not quoted by M. Hanotaux) that von Kluck is said to have been directed to bring his Army into second line on the Marne between Château-Thierry and Ferté-sous-Jouarre behind von Bulow (German Second Army).

But von Kluck was a cavalry general and his experience from Mons to Compiègne had led him to believe that his opponents were routed and disorganized, and the one great point to keep in mind was that a routed enemy should be given no respite from pursuit.

Either (and most probably) in accordance with the orders of the Great General Staff, or simply conforming with the movements of the Allies in retreat, von Kluck's Army changed direction on August 31st from, roughly speaking, west to south. Ill-informed opinion imagines the whole of von Kluck's Army from this date as marching on Paris; but what it was really marching on was the Marne. Five army corps in line over a considerable front and only the two corps on the right came anywhere near Paris. These were the corps (IVth Reserve and IInd) that made the flank march across the northern front of Paris entrenched camp from the Oise to the Marne, caused by the necessity of converging on the latter river in accordance with the orders or instructions received from the Higher Command.

According to M. Hanotaux, who follows the German military writer Stegemann, von Kluck obeyed these orders in concentrating his Army on the Marne between Château-Thierry and La Ferté-sous-Jouarre, but disobeyed them in crossing at once to the left bank. The German Headquarters' plan required that the First Army should remain at first concentrated on the right bank, in order to guard against a sortie from the Paris entrenched camp. But, as already mentioned, General von Kluck's idea was to push the pursuit of a beaten and apparently disorganized enemy, and he considered it sufficient to guard against a sortie by leaving his IVth (Reserve) Corps and a cavalry division only on the right bank of the Marne.

He may also have resented the idea of the Second Army (von Bulow) being ordered to cross, while his own ever-victorious Army was to be relegated to second line.

The fact that von Kluck was removed from command after the battle supports the theory that he wilfully disobeyed his orders in allowing four of his corps to cross to the left bank of the Marne—having, as we know, to recall them subsequently in succession to

support his IVth Reserve Corps, which was attacked on the evening of September 5th by the French Sixth Army (Maunoury).

As to his supposed designs on Paris, he may at one time, up to September 1st, have had the intention of supporting his cavalry corps (von der Marwitz) with the IVth Reserve Corps in a raid on Paris. But von der Marwitz was brought to a halt at the southern edge of the Forest of Compiègne on September 1st by the combat of Néry (glorious to British arms, although outpost dispositions defective); and aerial reconnaissance soon made it clear that it would be hopeless to expect any results from a raid of cavalry supported only by one army corps opposed to the forces assembled in the entrenched camp of Paris.

M. Hanotaux quotes an order, signed by one of von Kluck's Staff, directing the IInd Corps to cross the Marne between Château-Thierry and Ferté-sous-Jouarre on September 3rd.

It is, therefore, obvious that von Kluck could have had no serious intentions against Paris (with only one army corps and cavalry available) on the date on which this order was signed.

He is reported to have said himself in conversation that had he remained on the Oise and attempted an attack on Paris, the Army of the entrenched camp might have cut him off from the rest of the German Armies and from his communications.

HOW TIRPITZ RUINED THE GERMAN FLEET.

By CAPTAIN L. PERSIUS (Ret.).

Translated and epitomized by
CAPTAIN FRANK C. BOWEN, Royal Marines, Reserve of Officers.

THE writer begins by discussing the sudden collapse of the German military system, and especially remarks on the death-blow to the old *régime* having been dealt by the German Navy. Those who have been deceived by the lies spread abroad through the Press are now, says the author, asking themselves the following questions:—

"The men on board the ships were far more comfortable than the men in the trenches—they had warm homes, good food, etc. How then is it possible that the spirit of unrest emanated in the first place from the Fleet? Were they not satisfied with their condition? What was the cause of it all?"

This question is a perfectly legitimate one, when proceeding from the mouth of the masses of the people; that is, from the mouth of those who had not the opportunity of coming into close touch with naval men and who were not aware of the truth regarding our Fleet and its personnel. Those who knew how matters stood with the Navy had for some time recognized the fact, that the spirit reigning among the naval officers was such that they had no hold over their subordinates; that it was but necessary for the smallest spark to set on fire the powerful mass of inflammable matter which had been accumulating during the course of the war among the ratings and stokers through the conduct of those who were set over them. Even before the war there were many complaints as to unjust and unworthy treatment issuing from the ranks of warrant officers, petty officers, and stokers. They were just complaints. Ever since William the Second's accession to the throne Prussian militarism had laid ever more powerful hold on the Navy. The haughty lieutenant, "whom none can imitate," is in a large measure blamable for the discontent of the men. No candid man will maintain that the Navy was difficult to handle. On the contrary, it was an easy task to lead and to satisfy this splendid material. It was only necessary to show a little sympathy, to make the men feel that they were of the same flesh and blood as the officers, and they were at once touchingly willing and loyal, ready to suffer any hardships, ready to sacrifice their health—yes, even their very lives.

As early as the year after the outbreak of war, it became manifest that the spirit reigning in the officer corps was not such as was

generally supposed. This was proved by a Cabinet Order issued by the All-Highest which may be summarized thus:—

"Headquarters, September 7th, 1915.

"Official reports and private remarks which have come to my knowledge have shown me that there prevails in my Navy mistaken ideas of the situation, which tend to spread abroad false and pessimistic impressions.

"Although my regrets in this respect are tempered by my joy at the stirring deeds of my Navy, I must earnestly warn my officers to encourage the spirit of cheerful performance of duty in all places. . . . To accomplish this the officers must place the greatest restraint upon themselves in order not to prejudice the spirit of the men under them and so become accessory to the criminal and lying reports. . . . I must, however, count it as one of the greatest military faults should any officer let fall adverse criticisms on the Supreme Command, criticisms which unfortunately only too often are indiscreetly spread abroad and work a baleful influence on the Navy. . . . I demand the most absolute trust in and obedience to my will as Chief War Lord, for I bear the heavy burden of responsibility for the future welfare of the Empire. . . . ."

Here again we have words, cheap words, but as in times of peace so now—they were not followed up by deeds, deeds which should have consisted of measures taken to quell the spirit of dissatisfaction; in other words, to provide for the well-being of the men. The tone of this Order in Council proves that the good old Prussian spirit had already, after one year of war, disappeared from the officers' corps. To be sure, there were many exceptions, officers who in every respect were models of what an officer should be, who discharged their own duties with devotion, and were able to exact the same devotion from their subordinates, because they handled them with due consideration. A short while ago a certain petty officer spoke of his captain to me in the following words: "He was a splendid fellow, we all worshipped him; willingly and cheerfully did we go with him to meet death." (The sinking of one of our small cruisers was in question.)

Because there were far too few officers such as this, the spirit of discord spread abroad in the Fleet. It would, however, be quite useless to heap reproaches upon isolated officers. They were merely the outcome of the system so unhappily prevalent in the Navy. He should stand in the dock who is responsible for this criminal system. A considerable portion of guilt for the discontent of the warrant officers, petty officers, and ratings should be laid to the share of Tirpitz. He arrogated to himself all power over the Navy, meddled in questions relating to organization, which were in reality not within his province, suffered no contradiction from headquarters.

To obtain costly material with which to build his great ships he neglected to respect the wishes of those under him in regard to better accommodation for the men, etc. He obtained money for his big ships

alone. To all representations made in the Reichstag in regard to the comfort of the men he was deaf.

Even the highest admirals were utterly powerless against Tirpitz. Let us recall the dismissal of Count Baudissin, chief of the naval station in the North Sea. Baudissin, in spite of the fact that he was aide-de-camp to the Kaiser, was suddenly relieved of his post of Chief of the Admiralty Staff at the instigation of Tirpitz, because he had dared to protest against the insufficient number of submarines which were being built and against the reckless amount of money lavished on the building of big ships. Later on, when Chief of the North Sea Station, he took up his stand for the "Deck offiziere," whose pay Tirpitz wished to reduce contrary to law.

In the secret memorial which Admiral von Holtzendorf addressed to the Kaiser on January 14th, 1913, after having served for ten years as Chief of the High Seas Fleet, he refers in the following terms to the shortage of men which led to the overworking of the naval personnel and consequently to discontent: "It is high time that a permanent increase in the personnel of the Fleet should be provided, else within a short time, superficiality, unreliability, and lack of interest in duty will gain such a firm hold that it will be impossible for the best and most worthy types of men to counteract this and ensure success for your Majesty's battleships and cruisers." Tirpitz always economized in the wrong places. The yearly repairs necessary for the proper maintenance of the officers' and petty officers' quarters were neglected. The men's accommodation on the new ships was insufficient. No arrangements were made in Wilhelmshafen for married quarters, etc. These things all combined, even before the outbreak of war, to influence unfavourably the feeling in the Fleet.

In the course of the war the strain became acute. To a great extent the High Seas Fleet was condemned to inactivity. Depressing influences were at work: the monotony of life on board, the crowding together in a confined space, the everlasting drill, Prussian militarism, that is, the limited understanding of the spirit governing the sailors; want of all regard for the individuality and the repression of their souls, unworthy treatment, severe punishment for the slightest fault, want of all redress for grievances, distrust in the weapons of warfare, gradual recognition of the fact that it was all in vain, that the Navy could not stand against the overpowering might of the enemy; above all, the knowledge that submarine warfare had failed. Add to all this the slights put upon the engineer corps, a body of men whose work was beyond all praise, upon the medical officers and the pay-masters, slights which had been noticeable even in peace time, also the disregard shown to the excellent reserve officers, petty officers, and ratings; and lastly, the ever-increasingly bad commissariat, while in the Commandant's and officers' mess luxury reigned and high carousals were held. In regard to the commissariat one folly after another was committed. . . . . Further, a reckless expenditure of money took place during the war, for the benefit of those who needed no assistance. Numerous admirals—eighty—were maintained. Fourteen of them were accommodated in the High Seas Fleet—a super-

abundance—but the distribution of the remainder among the few remaining ships which were available was really a masterpiece. The greatest indignation was caused by the fact that officers despatched food to their own families which had been intended for the use of the crews. Naval officers in shore billets acted in similar fashion. The false official reports also tended to increase the ill-feeling. Losses were seldom acknowledged. The customary tale ran thus—"No lives lost, material damage slight." But to take only one example—"Seydlitz" alone numbered 168 dead, after being hit by English fire. Faulty material, particularly on the submarines and airships, claimed countless victims. Too reckless exposure of the men's lives created great bitterness. Here is one example, which is known in the Navy as "child-murder in a Baltic port": An admiral, who remained safely on board his cruiser, unscrupulously and without any military necessity, drove nine destroyers upon a mine-field in the endeavour to force the Reval barrage. He reproached the officer in command of the destroyers in the following words: "If only you had not spent so much time saving lives . . . . ."

Enough, it may be urged, the above-mentioned examples were exceptions. However, I must say that the amount of material accumulated by me in the course of four years of warfare justifies me in the declaration that they cannot be regarded in the light of exceptions. Nothing flourished so much with us as intrigue and gossip. While those in official positions took great pains to keep the nation in ignorance, and it was thought possible also by the representatives of the Press in the Reichstag to impose upon the people the veriest fairy tales, men of all ranks attached to the Navy, from admiral to A.B., saw to it that ample and minutely detailed news should be freely circulated!

In unison with the unsatisfactory vital conditions, that is, defective accommodation and victualling, and unworthy treatment, the failing trust in our Army aided in the dejection of our Navy personnel. It was soon clear to every sailor and stoker that it was vain to attempt to fight against the overwhelming superiority of the enemy. In August, 1914, we possessed vessels to the amount of somewhat over one million tons, against the British warships of 2·2 million tons. It was also a matter of widespread knowledge that the quality of our ships' material, apart from the quantity, was inferior to the British. This indisputable fact we owe to Herr von Tirpitz! Our ships of the line, battleships, cruisers, and armoured cruisers, yes, even the destroyers, were of less displacement than the British, were less strongly armed, and of lower speed. The reproach that the Reichstag refused sufficient supplies is absolutely untrue. In England far more was accomplished for the same amount of money, and progress was made in regard to greater displacement, increase of speed, and higher calibre of guns, while Tirpitz failed in all these respects. If we compare the strength of the two navies, if we take into consideration the fact that the Russian Baltic Fleet of 200,000 tons must also be reckoned on the side of the enemy—the French naval fighting forces were for the greater part kept in the Mediterranean Sea to oppose

the Austrians—we see at once that our Fleet had but a poor chance. In spite of this our Navy personnel accomplished great things, as far as it was possible for them to act under the circumstances and with the defective material at their disposal. With few exceptions officers and men behaved splendidly. In nearly all cases of defeat the guilt lay upon Herr von Tirpitz for his perverted ship-building policy. Let us reflect a moment on the fight which took place on November 9th, 1914, between "Emden" and "Sydney," when the celebrated cruiser of Captain von Müller came to an end. "Sydney" and "Emden" were of similar type, they were armoured cruisers (*sic*). The English cruisers are, however, on the average, larger, and are invariably armed with 15·2 cm. guns, while the German cruisers are smaller and only carry 10·5 cm. guns. Of course, "Sydney," with her one-third greater armament, soon put "Emden" out of action without placing herself within range of the latter's fire. It was the same in the battle of the Falkland Islands. On the German side the large ships in the first line were "Scharnhorst" and "Gneisenau," on the English side "Inflexible" and "Invincible." "Scharnhorst" and "Gneisenau" were launched in 1906, "Invincible" and "Inflexible" in 1907. The latter had a displacement of 20,300 tons, and were provided with 30·5 cm. guns, while the German ships had a displacement of only 11,600 tons, and their armament consisted of 21 cm. guns. Lastly, the speed of "Scharnhorst" and "Gneisenau" was 22·23, of "Invincible" and "Inflexible" 26·5 knots. In the fight off the Doggerbank the armoured cruiser "Blücher," launched in 1908, 15,800 tons, with a speed of 25 knots, and provided with 21 cm. guns, fought against English battle-cruisers "Lion," "Tiger," "Indomitable," etc. (The last named ship was launched in 1907, 20,300 tons gross, speed 26 knots, armament 30·5 cm. guns.)

Off the Skagerrack our Fleet was preserved from disaster through the clever leadership of Admiral Scheer and the unskilful handling of the British Fleet under Admiral Jellicoe, bad visibility working in our favour also. Had visibility been good, and had there been a resolute chief on the side of the enemy, the result would, according to all human calculation, have been disastrous for us. The British guns, with their much greater range, would have completely annihilated our less powerfully armed ships. The losses sustained by our Fleet were enormous, in spite of the fact that luck was on our side, and on June 1st, 1916, it was clear to all intelligence that this fight would and must be the only one to take place. Those in authority have often openly admitted this!

Tirpitz learnt nothing from the events of the war. Representations were made unceasingly by destroyer and submarine commanders to the effect that they must have guns of higher calibre in their boats; in vain did the airship commanders complain that their engines were continually breaking down, and that they wished to have better and more serviceable ones such as were offered by a different firm from that favoured by the naval authorities—we shall have something further to say upon this subject. Tirpitz remained deaf, even in spite of Weddigen's exploit with "U.9." On all sides he was

besought to build more submarines. He would not even consider such a thing; and so, under him and under his successor, Capelle, right on until October, 1917, innumerable valuable workmen were employed and much costly material was used in building useless big battleships which could never by any possibility be used during the war. At last, on October 1st, 1917, certain members of the Reichstag, among them Struve and Gothein, succeeded in gaining the ear of the Supreme Command—not of the Admiralty! The order was issued to stop building battleships and armoured cruisers. In the meantime the necessary material for submarines had become so scarce that in order to make building possible, it was necessary to break up battleships and other vessels. At the beginning of 1918 the following ships were appropriated for this purpose: the battleships "Schlesien," "Schleswig-Holstein," "Hanover," "Deutschland" (which had only been launched in 1906!), further, "Lothringen," "Preussen," "Hessen," "Elsass," "Braunschweig," "Wettin," "Wittelsbach," "Kaiser-Barbarossa," "Karl der Grosse," "Wilhelm der Grosse," "Kaiser Wilhelm II.," "Friedrich," "Brandenburg," "Wörth," "Würtenberg," "Baden"; eight coastal armoured cruisers, the "Agir" and her consort, etc.; the armoured cruisers "Roon," "Heinrich," "Bismarck"; five ships of the "Hansa" class; "Kaiserin Augusta"; and lastly, fifteen light cruisers. In this year—1918—our High Seas Battle Fleet, therefore, consisted only of the Dreadnoughts, the battleships "Nassau," "Helgoland," "Kaiser," and the "Markgraf" class, and a few armoured cruisers. The rest of "Herr von Tirpitz's creations" were discarded with the recognition that these "creations," i.e., all the ships built at the cost of untold millions by Tirpitz during his term of office from 1897 until 1906, were unserviceable, and incapable of competing in battle with the British ships.

Now as to the submarines. The Order in Council issued by the All-Highest at the opening of the unrestricted submarine warfare on February 1st, 1917, and published in the official Navy Gazette, ran as follows:—

> "In the impending decisive struggle, the task falls to the lot of my Navy to turn the English weapon of starvation, by means of which our most hated and most stubborn enemy hopes to overthrow the German people, against England herself and her Allies through the annihilation of her traffic at sea by every means within our power. For this object the submarines stand in the first line. I expect that this weapon, which has been developed with wise forethought and technical sagacity and which is backed by the energetic and willing labour of the dockyards, working in unison with the other fighting means of the Fleet, and manned with the spirit which in the course of the war has been productive of such splendid deeds, will break our enemies' will to fight."

Unrestricted submarine warfare was, apart from any moral consideration, next to the invasion of Belgium at the beginning of the war, the greatest mistake made by the Supreme Command. The

declaration of February 1st, 1917, has delayed peace which at that time was within measurable distance, and which would have then been a far more favourable one than we now have in prospect. It converted America from a neutral intermediary into an ally of our enemies, set the whole world against us, and brought about the loss of the war for us. It caused a shrinkage in the sea traffic of the few remaining neutral powers and herewith considerably lessened our own food supplies. But it was impotent to prevent America transporting an army of a million men across the Atlantic Ocean with armaments and munitions, aircraft and tanks, and the whole gigantic apparatus necessary for the conduct of war, such as a first-class industrial nation —a nation of unlimited possibilities—was capable of.

How was it possible that the Supreme Command could commit this terrible mistake, of which the consequences were so overwhelming? It was only rendered possible by the fact that it was permeated by an overweening Pan-Germanism, because it set too high a value on our own strength and too low a value on that of the enemy. Hindenburg said, as was reported by the Wolff Telegraph Bureau on July 2nd, 1917: "We shall win the war if we can withstand the attacks of the enemy until the submarine warfare has accomplished its work. Our submarines are doing well. They are destroying the enemy's food supplies faster than we thought possible. Within a reasonable time the enemy will be forced to sue for peace. . . . . ."

Is the Supreme Command, that is, the Kaiser, to be made responsible for the result of the war with which we are now confronted? This question must be answered in the affirmative, for the Supreme Command has, when all is said, to bear the responsibility in any case. Nevertheless, we must not forget the source from which proceeded the statement and assurances which led to the decision for the promulgation of unrestricted submarine warfare; that is, the head of the Imperial Navy. The Supreme Command was forced, after all, to rely upon the assertions of the head of the Imperial Navy. It is true the Supreme Command cannot be absolved from the crime of having acted without exercising sufficient care. If the Supreme Command had earnestly weighed in the balance and carefully examined the too optimistically coloured calculation of the head of the Imperial Navy, the decision would in all probability have been other than it was. Here, as we said before, Pan-Germanism played a formidable rôle. Tirpitz, the incarnation of Pan-Germanism in its most hated form, set in motion submarine mercantile warfare on February 18th, 1915, and he also was the most violent agitator in favour of unrestricted submarine warfare begun on February 1st, 1917, although he was not in office at that time. He sent in his resignation in March, 1916, his propaganda for unrestricted submarine warfare appearing to the Supreme Command to be premature. The chief blame for the declaration and for the failure of submarine warfare must in each case be laid to the charge of Herr von Tirpitz.

Commercial submarine warfare and unrestricted submarine warfare were begun. Through proclamations issued by the All-Highest and other methods the people were assured that within a short period

England would be starved out and compelled to surrender. The weapons necessary for this purpose were not to hand. Under Tirpitz they were not furnished. In time of peace and, what was more important, during war-time, Tirpitz did not push on the building of the submarines, which were so vital to our interests. On November 7th, 1905, he said in the Reichstag: "I am not an enthusiastic advocate of submarines." His actions were in accordance with this speech up to his last days in office! Tirpitz never realized the power of the submarine. In 1914 he said to the American correspondent, von Wiegand: "Before the war I did not think that our submarines could remain away from their base for more than three days at a time, believing that the crew must by then be in a state of exhaustion." So that it was learnt during the war for the first time that submarine crews could remain for weeks at a time—seven—at sea! It is clear that, as the capabilities of the boats were not tested during peace-time, no proper appropriation of them could be made in time of war, and no correct judgment formed of their needs as regards provisioning, etc.

When war started, according to the official "Naval Record," we had twenty-seven submarines ready, of which, it goes without saying, the older ones could not be used for active service. After Weddigen's glorious deed on September 22nd, 1914, when three English armoured cruisers were sunk, it might have been supposed that Herr von Tirpitz would have set about building submarines with all possible despatch. Far from it. From August, 1914, to March, 1916, when he was dismissed from office, Tirpitz collected only 80,455 tons of submarine material at our docks. He argued that that was all the docks were capable of dealing with. Contrary to this the dockmasters have announced that at that time an almost unlimited number of submarines could have been built. Tirpitz gave orders for submarines to a few private firms only ("Germania" Kiel, "Vulkan" "Hamburg," "A. C. Weser" and "Blohm and Voss"), while over a dozen dockyards put themselves at our disposal, and it has since been proved that these works were in a condition to build submarines also. At the conclusion of the war, besides the above named, the following dockyards were in requisition: Schichau, Bremen, Vulkan, Tecklenburg, Neptun, Atlas, Seebeck, Howaldt, Flensburg, Nordseewerke.

After Tirpitz was dismissed from office, that is, on March 15th, 1916, his successor, Admiral von Capelle, put into commission 100,000 tons between March, 1916, and June, 1917. This was not much, still it was something. It is sufficient to prove that von Tirpitz had not done his duty! But it was not sufficient to meet our needs. Herr von Capelle endeavoured energetically and earnestly to fulfil his duty as far as he saw it. He took all manner of things into consideration, such as, for instance, "What use can we make of the many submarines later on when peace is established? and what is to become of the many lieutenants and commanders?" (also with reference to their promotion); he also expressed the opinion that it was needless to put into commission any more submarines, as he personally "is of the opinion that the war will end this autumn (1917), as unrestricted submarine warfare is sure to bring peace within six months' time."

At last, unfortunately very tardily, the aforementioned members of the Reichstag belonging to the Liberal party succeeded in increasing the number of submarines in commission. On the instigation of von Bethmann-Hollweg, to whom these members had made an urgent appeal as they were unable to obtain a hearing at the Admiralty, 63,506 tons were commissioned in June, 1917. Ludendorff's help was also called for in October, 1917, for a further 93,996 tons. Moreover, on July 5th, 1917, after some opposition, Herr von Capelle admitted in committee that he had received from the Chancellor "general instructions" on the subject; he said: "Reckoning on the long duration of the war and on protracted peace negotiations, the Chancellor has requested me to conform to the political situation induced by these considerations in regard to submarine building for the years 1917-18." Now at last our dockyards were suddenly enabled to meet our requirements! Some time previous to this Herr von Capelle had announced "that we were unable to produce more submarines than were at present in commission." On the urgent appeal of the progressive members, therefore, at Bethmann-Hollweg's mandate, more submarines were put on order in one day than von Tirpitz had commissioned during the whole of the year 1915.

But even this was far from bringing the submarines up to the necessary strength. The number of our enemies increased, defensive measures against the submarine weapon were perfected, our losses in "U"-boats mounted up. Untiringly, responsible men endeavoured to bring pressure upon the Admiralty to lay down more boats. Even again their endeavours were wrecked by the opposition of Herr von Capelle. He maintained now as he had done before, that the dockyards could do no more. Hardly had von Capelle quitted office in September, 1918, before the Chief of the Admiralty Staff, Admiral Scheer, had commissioned our dockyards to lay down 333 submarines, 224,800 tons—far the most extensive order on record. So that now in the fifth year of war our needs were at last recognized, and it at last became known of what our dockyards were capable. It was to this that the member Stresemann referred when he said in Parliament on October 22nd, 1918, "The Admiralty rejected sundry industrial offers, and this should now be thoroughly examined into."

Many people will be astonished at the number I have named—333. During the course of the war many fantastic rumours were current among us in regard to the number of our submarines. One heard of our possessing many hundreds, nay, even thousands. The number of boats ready for use at the front never reached the number 150, even reckoning in large, medium-sized, and small altogether. The submarines placed on order by Herr von Capelle at the dockyards would, if building were still continued, only be ready for use in 1919 and 1920—as far as the large boats are concerned. The completion of a large boat, that is, one of 800 tons, required, in round terms, 24 months to start with, then later on 30 months and even more. The smaller boats of 127—267 tons could be completed in 13 months.

It might be interesting, by the way, to learn how greatly the cost of production increased in the course of the war.

Submarine tonnage cost:—

1914 ...	4,110 marks.	1917 ...	6,067 marks.
1915 ...	4,450 ,,	1918 ...	9,000 ,,
1916 ...	4,850 ,,		

In official quarters it was constantly announced that the extraordinarily small losses were many times covered by the new productions. That is not the fact! As concerns our losses and our increase I take the year 1917 as an example:—

1917.	Increase.	Loss.
January	6	4
February	3	3
March	4	6
April	4	1
May	6	5
June	8	3
July	10	4
August	12	11
September	8	1
October	12	12
November	5	7
December	5	9
Total	83	66

The following dates suffice to give an idea of our position in regard to submarines:—

1917. April	126 "Front"	boats.
June	134 ,,	,,
August	134 ,,	,,
October	146 ,,	,,
December	137 ,,	,,
1918. January	133 ,,	,,
February	136 ,,	,,
April	128 ,,	,,
June	113 ,,	,,

It must be understood that of those designated "Front" boats, there were only a very small percentage at the front, i.e., on active service. In January, 1917, for instance, when circumstances were still favourable to us, 12 per cent. were at the front, 30 per cent. in port, 38 per cent. under trial, in course of building, etc. and 20 per cent. were withdrawn. In the course of a year of warfare the boats suffered greatly. The crews, often insufficiently trained, were no longer imbued with the same sense of trust in their weapons. Submarine material deteriorated steadily, many boats foundering during their trial, as, for instance, "U.B.79," "U.B.84," "U.B.106," "U.B.114," "U.52" in the Imperial Dockyard, Kiel, and "U.C." off Heligoland, etc., etc.

It is easy to understand that latterly small inclination was shown to undergo the dangers of the submarine service, all the more so, as our experienced sailors perfectly understood the political situation and were well aware that all sacrifice was in vain.

What are the reasons for placing Herr von Tirpitz's guilt in the front line as regards our submarine warfare? The English paper, the *Manchester Guardian*, of June 4th, 1918, contains the following: "We have been saved in this war because the German Admiralty had not believed in the submarine, and did not, even after war began, divine its possibilities; we were, therefore, given time to build up our defensive measures as the danger grew. We must reckon that, when the next occasion comes, we shall not be given time. If Germany had been in the position from the beginning to make full use of this weapon, England would have been forced to surrender in consequence of her shipping losses."

And this article precisely expresses the facts.

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The scope of this pamphlet does not allow us to enter into a detailed account—take as an example the vacillation as to the type of submarine which should be chosen—of the enormous injury we sustained in consequence of the submarine policy followed by Herr von Tirpitz and his successor. The preceding remarks will suffice to show clearly that Herr von Tirpitz did not make such use of the submarine weapon as our interests demanded.

Now we come to the criminal manner in which our airship personnel was handled. Many proud words have been spoken of the remarkable work accomplished by the Zeppelins. It is true, towards the end of the war, when one airship after another was lost, when the raids on England ceased, some doubt as to their efficacy was voiced. On the part of the Pan-Germans, the explanation for the cessation of raids was that they had been stopped by those in authority purely on humanitarian grounds. This does not correspond with the facts. Technical imperfection of construction, particularly in regard to the engines, was the real cause of their failure. It will be remembered that a considerable number of airship losses have been officially admitted. According to information supplied to me from authentic sources, twenty-six airships were burnt in the summer of 1916 alone, half of them in the hangars, and therefore not through enemy action. An equal number were lost during the same period as the ships got out of control and drifted out of their course in consequence of the engines breaking down. The material used in the construction of the Zeppelins—aluminium—was the chief cause of the catastrophes. It is true many airships were also destroyed through the enemy's defensive measures—shot and shell—and so forth. But, in spite of this, it is safe to say that airships were very frequently lost in consequence of their lack of power of locomotion when within range of the enemy's fire. The number of airships lost when far from enemy territory is extraordinarily great. The official report in this case ran: "The loss arose through drifting." One may take it for granted that drifting was sometimes caused by damage to the engine, brought about by shell-fire. At all events there remain a large number of cases in which it is absolutely certain that the blame lay in the faulty construction of the engines. Complaints made by the airship commandants which have reached my ears have convinced me of this. Take, for

example, "L.19," the tragedy of whose fate will surely remain fixed in our memories on account of the attendant circumstances. On account of the "attendant circumstances," that is, the fact that after the wreck of the airship in the North Sea, the drifting crew were left to perish by the captain of the English steam trawler "King Stephen," from whom assistance had been implored. "L.19" was lost in February, 1916. Doubts arose some months later in regard to the efficiency of the engines. The *Berliner Tageblatt* was in a position to publish on August 4th, 1916, doubtless through some failure on the part of the Censor's office, a report copied from the *Berlinske Tidende* of a detailed statement directed to the authorities by Lieut.-Commander Löwe, commander of the airship "L.19." A fisherman of Narstrand found a bottle in the Skagerrack containing this statement and the last greetings of certain members of the crew. Among other things the commander's report contained these words: "With fifteen men on the platform the envelope is floating without a car. I am endeavouring to send a last report. Three engines are out of gear. The three engines broke down simultaneously, and this intensifies the seriousness of our situation. At one o'clock in the afternoon our last hour has arrived.—Löwe." With all the engines broken down it was impossible to send out a wireless call for help. The man in the street will ask, how was it possible that all the engines should give out? The answer is brief: "Because the Admiralty criminally failed in its duty."

I summarize the evidence, culled from official reports, as follows: In November, 1915, in the motor works at Friedrichshafen, out of a series of ten Maybach engines, six were ready for delivery, the other four were destined for "L.19." The engineer who had been commissioned to purchase the six engines, a man of skill and a man whose integrity was beyond question, could not conscientiously accept these engines, with which repeated and numerous trials had been made. Frequently was he approached by the firm and besought to take over the engines, but all their attempts were in vain, and they remain unappropriated to this day unless some other engineer has been found willing to bestow them on some fortunate naval airship! Out of this series the four destined for "L.19" were accepted without ado by the representations of the Admiralty. The naval inspector who had been in command there for three years was not capable of giving an expert opinion. One of the higher officials gave voice to the remark that in all his life he had never before had anything to do with "combustion" engines. In reply to the question as to how they could have allowed themselves to be so grossly deceived by the firm at the time of trial, it was answered that if any objection was raised, the firm simply appealed to those in high official positions and dismissal ensued. One had to think of one's family, etc., etc. Lieut.-Commander Löwe made inquiries at the beginning of November, 1915, during his stay in Friedrichshafen, as to whether the engines destined for "L.19" were really in working order. He spoke bitterly of the naval inspector who, it is true, superintended the construction of ships and airships for active service, but who, unfortunately, was

never obliged to accompany them to the front. The naval inspector did not take into consideration the exigencies of active service. Lieut.-Commander Löwe said that, unhappily, he was compelled to sail with "L.19," as the naval inspector had accepted both airship and engines from the firm as fit for active service.

On November 22nd, 1915, "L.19" set sail after many abortive trials. She could never have reached her destination. She continually drifted owing to her engines breaking down. From November, 1915, until eight days before the accident in February, 1916, "L.19" had been in Dresden. Repeated attempts had been made to take the airship to the front for active service. During these attempts many defects in the engines had become apparent. Cylinders and cylinder bolts corroded, crankshaft sockets melted and had to be changed many times over, one whole engine had to be replaced. So far the report.

The afore-mentioned "bottle-post," made use of by the crew of "L.19," proves that in consequence of three of the engines breaking down, and finally also the fourth and last, the airship was compelled to fly so low when crossing Holland that she was exposed to gun-fire. The ship, drifting about helplessly in the air without engine-power, was irretrievably doomed to disaster.

The Maybach engines now in question—as we learn from the aforementioned report—had long before these events been prohibited for use in active service on the land front, as, in consequence of frequent breakdowns, very many men had met with their death. This prohibition was extended to traffic at home. In spite of this the Navy continued to endanger the lives of the men by their use. The firm, Schütte-Lanz (Airships), were unable, in spite of the most earnest representations, to free themselves from the necessity of using Maybach engines, and were not permitted to substitute those of another firm—one which is widely known and of good repute. The naval airships were not allowed to be fitted out with any but Maybach engines, notwithstanding remonstrances on the part of Daimler and Benz and certain airship commandants who protested strongly against the Maybach engines. No improvement was made in them in 1916. Pressure was brought to bear from high quarters to prevent their being discarded. That the company prospered exceedingly the following figures will prove: An airship was sometimes constructed in a period of from fourteen days to three weeks. The dividends paid by the Zeppelin Company, established at Friedrichshafen, ran to 65 per cent., so I am informed! How about this?

As was the case with "L.19," so it was with the other airships. When our naval airships returned from their raids on English soil they were often obliged to lie idle for weeks together in Tondern, Nordolz, etc., because sometimes the most important parts of the engine had to be repaired, sometimes the entire engine had to be exchanged. The manufacture of the parts to be substituted took place in a factory at the other end of the Empire, and in a place with which means of communication were poor. So much for our "perfect" organization!

It will be understood that the above is not intended as a reproach to any particular officials, understrappers of the Admiralty. It is merely used to prove how hide-bound the prevailing system was, hemmed in on all sides by tradition. Those in the highest positions are answerable, those who could never bring themselves to act on different lines, who would not allow new and enterprising firms to participate in the naval output, those who continued fast bound in red tape.

It is scarcely necessary to point out how great was the damage brought on our own people by the airship raids on England, while at the same time they served no military purpose. It is known that when the question came before the Supreme Command as to whether the weapon of aircraft should be used in its most rigorous form, namely, on unfortified towns such as London—for London was absolutely unfortified—voices were raised on different sides in solemn warning against this step, amongst them that of Herr von Lyncker. His representations were ignored, as were those of other men of sound judgment.

How little our enemies troubled about the Zeppelins—the few Schutte-Lanz ships still available do not count—is proved by the fact that in the armistice terms they did not demand the surrender of a single airship!

* * * * * *

We draw to a conclusion. Some people may have read the foregoing remarks, in particular the arraignment of Herr von Tirpitz, with bitterness. It is always tragic when a great, a national hero, such as Tirpitz was until quite lately—else he would not have been the chosen chief of the Fatherland Party—is thrown from his pedestal; still more tragic is it when such high hopes for the future of the Empire have been bound up with him, hopes which have proved so fantastic. Tirpitz has, as has been shown, been guilty of many mistakes in constructing vessels which, though useless in war, yet helped to bring war upon us. For when we get to the bed-rock of the cause of the war, we must recognize that the rapid construction by Germany of large battleships was an outstanding factor. Professor Hans Delbrück wrote in the "Prussian Year Book" (October, 1918):—

"The mistaken naval policy of Admiral von Tirpitz, who, instead of building submarines, built one Dreadnought after another, which could not prevent the blockade of the North Sea, but which caused the anger of the English to rise to fury, brought about great evil, together with . . . . ."

The policy pursued by Herr von Tirpitz in constructing large battleships was both unwise and at the same time useless, for we never could have built a navy to equal that of England; also Tirpitz committed the technical fault of constructing ships to rival English vessels built at the same time, but which were of greater speed and more powerful armament.

As regards submarine material and types of boats, Tirpitz showed no forethought and failed in his duty, as has been plainly shown. In November, 1914, in the course of an interview with the American,

von Wiegand, he said: "England will try to starve us out, but we can play the same game, and torpedo every English vessel or every vessel belonging to her allies when they reach the vicinity of an English port, and thus cut off the greater part of her food supplies." When the query was raised as to whether Germany possessed the requisite number of submarines, Tirpitz replied: "Yes, we possess a superior number of submarines of a large type." Incidentally, be it remarked, this, too, was not precisely the case. As a proof of his "forethought" at a later period we need only recall Tirpitz's interview with the representatives of the *Neuer Peste Journal* in January, 1918, during the course of which he remarked: "America's military help is a phantom!"

Bismarck said he hoped that no un-German passion for prestige and increase in our Fleet, such as might be taken as a sign of enmity, would drive England to form a coalition against us. To-day there are many who will maintain, and rightly so, that Tirpitz's un-German passion for prestige has brought terrible adversity upon us, and who will say of him as Chamberlain Oldenburg-Zanuchau said of von Bethmann-Hollweg on February 18th, 1918, at the convocation of the "Farmers' League": "It is my belief that no minister has ever brought such calamity upon his sovereign and his country as he has."

The answer to the question: Was Herr von Tirpitz fitted to be the head of the Navy for so many years (1897 to 1916)? is in the negative. Through his fatal eagerness to comply with the wishes of the Emperor in regard to a large Navy, Tirpitz burdened us with naval preparations, which, when we get down to the actual facts, we see were largely the cause of the outbreak of war. It is our duty at the present time to recognize this clearly, for now is not the time to indulge in sentimentality. We must face facts plainly, must free ourselves from all shackles, and among these we must reckon the blinkers for which we have to thank the old *régime*. To speak plainly and to spread abroad the truth is the duty of every man who loves his country to-day, and in this belief I have endeavoured to speak the truth concerning our Fleet.

NAVAL NOTES.

GREAT BRITAIN.

The narrative of naval events in this issue of the JOURNAL covers the period from April 1st to June 30th. The changes at the Admiralty and in commands afloat, the operations of the British Navy in the Baltic, and the scuttling of the interned German ships at Scapa Flow, are dealt with in separate sections, before the other naval occurrences of the quarter.

THE BOARD OF ADMIRALTY.

Changes have occurred, or been announced to take place, in the posts of Third and Fourth Sea Lords, Medical Director-General of the Navy, and Director of Navy Contracts. The new Patent rendered necessary by the appointment of Rear-Admiral J. A. Fergusson as Deputy Chief of the Naval Staff, in succession to Vice-Admiral Sir Sydney Fremantle, was published in the *London Gazette* on May 2nd. On June 21st it was announced that Rear-Admiral Sir William C. M. Nicholson had been appointed Third Sea Lord, in the place of Rear-Admiral C. M. de Bartolomé, to date July 1st. A few days previously the Admiralty had announced that Vice-Admiral Sir Alexander L. Duff, Assistant Chief of the Naval Staff, had been appointed Commander-in-Chief in China, to date July 24th; Rear-Admiral Sir Hugh H. D. Tothill, Fourth Sea Lord, Commander-in-Chief in the East Indies, to date August 1st; and Captain Sir Alfred E. M. Chatfield, late Flag-Captain to Sir David Beatty and Principal Gunnery Officer, Grand Fleet, to be Fourth Sea Lord, to date June 17th.

Of changes outside the Board itself, the appointment of Surgeon-Captain Sir Robert Hill, late Principal Medical Officer, Grand Fleet, to be Director-General of the Medical Department, in succession to Surgeon Vice-Admiral Sir William H. Norman, was publicly announced on June 3rd, the change taking effect from the 1st of that month. Sir Robert Hill was promoted to Surgeon-Rear-Admiral from the date of his appointment. On June 17th it was announced that Sir Frederick Black, Director of Navy Contracts, has, with the permission of the Board of the Admiralty, resigned his office in order to take up an appointment as a managing director of the Anglo-Persian Oil Company. Sir Frederick Black was appointed Director of Navy Contracts in 1906, before which he was Director of Naval Stores. In 1915 he was lent to the Ministry of Munitions on its formation as Director-General of Munition Supply, and subsequently he served as acting chairman of the British War Mission to the United States. Mr. Walter St. D. Jenkins, C.B.E., formerly Acting Deputy Director, has been appointed Director of Navy Contracts in succession to Sir F. Black. On June 28th, following the signing of the Peace Treaty with Germany, Vice-Admiral Sir Edward F. B. Charlton was selected to be President of the Naval Inter-Allied Commission of Control on the formation of that body. Sir Edward was formerly President of the Allied Naval Armistice Commission. He continues his present duties as Vice-Admiral Commanding on the East Coast of England.

NEW NAVAL COMMANDS.

In succession to Rear-Admiral J. A. Fergusson, on the latter being appointed Deputy Chief of the Naval Staff, Rear-Admiral Maurice Woollcombe was appointed

in command of the Devonport Reserve. His flag was hoisted in the "Collingwood" on April 9th, and transferred next morning to the "Colossus." On Rear-Admiral Sir Reginald Tyrwhitt relinquishing command of what had been previously known as the Harwich Force on May 1st, to take up in June the post of Senior Naval Officer at Gibraltar, the command of the First Light Cruiser Squadron was assumed by Rear-Admiral Sir Walter H. Cowan, whose flag was hoisted in the "Curaçoa." The light cruiser "Caledon," formerly flagship of Rear-Admiral Cowan, then became flagship of the 2nd Light Cruiser Squadron, and on May 14th Captain A. A. M. Duff, formerly commanding the battle-cruiser "Tiger," hoisted his broad pennant as Commodore, 2nd Class, in the "Caledon" to command the squadron. A change in the Flying Squadron, Atlantic Fleet, to which Rear-Admiral Sir Richard Phillimore was re-appointed on the reorganization in April, took place in June. On the 15th the flag of Sir Richard was struck in the "Furious," and his duties were transferred to Captain Wilmot S. Nicholson, formerly Flag-Captain in the squadron, who was to be known as "Captain (A)" as from June 16th. This brought the organization of the aircraft in the Fleet into line with the destroyers and submarines, which were under a Captain (D) and Captain (S) respectively. It was officially announced about this time that the appointment of Rear-Admiral, Second-in-Command, North America and West Indies, ceased to exist on February 9th, 1919, on which date Rear-Admiral (now Vice-Admiral) Morgan Singer assumed command of the North America and West Indies Station. On May 1st Rear-Admiral the Hon. Sir Hubert Brand, late Captain of the Fleet and Commodore, 1st Class, on Sir David Beatty's Staff, hoisted his flag in the "Alexandra" at Portsmouth in command of H.M. Yachts. It was transferred to the "Victoria and Albert" on that vessel being recommissioned on June 17th.

Baltic Operations.

During the period under review, the First Light Cruiser Squadron has been on detached service in the Baltic, and has on various occasions had small affrays with Bolshevik vessels. On May 10th Rear-Admiral Sir Walter Cowan arrived at Helsingfors in the "Curaçoa," and on landing was received by a naval and military guard of honour, and invited to luncheon by the Administrator, General Mannerheim.

On May 18th, British light forces in the Gulf of Finland, whilst co-operating with the Esthonian Army, encountered a Bolshevik naval force consisting of destroyers and small armed craft supported by a cruiser. The Bolshevik vessels were chased until they gained the protection of their minefields and shore batteries. Some of the Bolshevik destroyers were reported to have been hit, but the British forces sustained no casualties. Four days earlier, Bolshevik wireless messages from Moscow had reported that a cruiser and two destroyers "of unknown nationality" bombarded the region to the north of Ropsha, but without result. On May 17th, it was further reported, a descent was made under cover of warships in the region of Kaskolovo, seven miles to the east of the mouth of the River Luga, and twenty miles N.N.E. of Narva.

On May 17th it was officially announced in the Press that H.M.S. "Curaçoa" had struck a mine whilst operating in the Baltic. There were no casualties, and the ship, which only received slight damage, was proceeding to England for repairs. Accompanied by the destroyers "Seafire" and "Sepoy," the cruiser arrived at Chatham on May 21st. Earlier in the month the Admiralty despatched a number of submarines to strengthen the forces with Sir Walter Cowan. The depôt ship "Lucia," with the destroyer "Wryneck" and submarines "E.27," "E.40," "L.12," "L.16," and "L.55," left the Tees on May 15th for Helsingfors. A French naval detachment was reported at this time to be at Hangö, Finland.

Another encounter between Bolshevik warships and part of the British squadron in the Gulf of Finland took place on May 31st. The enemy fleet was apparently intending to attack the Esthonians, who are attacking the fort of Krasnaya Gorka on the southern coast, but on meeting the British ships they took to flight, the action lasting only forty minutes. The Admiralty *communiqué* said :—"On May 31st British forces patrolling in the Gulf of Finland encountered Bolshevik naval forces, consisting of one Dreadnought battleship and four smaller vessels, probably destroyers. After a short engagement the enemy retired behind their minefields. Our ships had no casualties." A Helsingfors telegram named the " Petropavlovsk " as the principal enemy ship and says the engagement took place west of Krasnaya Gorka.

On June 6th a Bolshevik *communiqué* announced that a submarine boat, which had attacked their torpedo boats on leaving the Gulf of Koporya, forty-five miles from Petrograd, had been sunk by artillery fire. On June 12th the British Admiralty confirmed this loss, stating that a submarine had been over-due since June 4th, and must be assumed lost with all hands.

According to information received on June 20th the Bolshevik naval forces had suffered loss in the Baltic off Kronstadt. A patrol vessel had been sunk and the cruiser " Oleg " was in a sinking condition. It was not true, however, as stated in the Bolshevik wireless report, that the latter vessel's injuries were inflicted by a British submarine. It was considered possible that the cruiser struck one of the Bolsheviks' own mines in the neighbourhood of Tolbuchin lighthouse. The cruiser was one of the vessels which ventured beyond the protecting forts of Kronstadt. A Bolshevik battleship, reported to be the " Andrei Pervosvanni," was torpedoed on June 19th near Kronstadt.

An official account of the naval actions against Bolshevik ships in May supplied an answer to the question in the House of Commons why British ships opened fire on the Bolsheviks. The British Admiral in charge of those actions says he " opened fire on the Bolsheviks because they opened fire on us."

Black Sea and Caspian.

No official announcements have been made in England concerning the doings of our naval forces in the Black Sea or on the Caspian, but certain information was received from other sources. The achievements of H.M.S. " Iron Duke," Captain W. W. Fisher, against the Bolsheviks on Sunday, April 27th, are recorded in a letter from the ship which has reached Portsmouth. It states that the enemy's headquarters at Vladislavoska were hit and the railway junction destroyed. The Russian Volunteer Army then occupied the town, and captured rolling stock, ammunition, food, clothing, and other stores, and were in pursuit of the Bolsheviks when the " Iron Duke " left the coast. From information received from a sea-plane and a Russian officer who watched the bombardment, there is no doubt that the work of the British naval gunners prevented a serious Bolshevik advance, which might have threatened the British Army in the Caucasus and the Royal Naval unit in the Caspian Sea. The town was cleared of the enemy in about twenty minutes, and the " Iron Duke's " guns accomplished with a few salvoes what it might have taken the Russian Volunteer Army three weeks to do.

In the first week of May, on the arrival in England of the ex-Empress Dowager of Russia, sister of Queen Alexandra and mother of the late Tsar, it was stated that the Imperial party, including the Grand Duke Nicholas, formerly commanding the Russian Armies in the Caucasus, were embarked at Yalta in April by the British battleship " Marlborough," Captain C. D. Johnson, which conveyed them to Prinkipo, the island in the Sea of Marmora which was proposed by the Allies as the scene of a conference between the various contending Russian

parties. Here the Grand Dukes and their families were transferred to the battleship "Lord Nelson," Captain L. L. P. Willan, which conveyed them to Genoa, arriving on April 23rd. The ex-Empress Marie remained on board the "Marlborough," and travelled in her to Malta, whence with her suite she sailed for Marseilles, *en route* to London.

Scuttling of the German Fleet.

About midday on Saturday, June 21st, by order of Rear-Admiral von Reuter, an attempt was made to sink the entire German Fleet, consisting of eleven battleships, five battle-cruisers, eight light cruisers, and fifty destroyers, interned at Scapa Flow. The plot succeeded in the case of all the ships except the battleship "Baden," the light cruisers "Emden," "Frankfurt" and "Nürnberg," and twenty destroyers, which remained afloat or were beached in a sinking condition. Vice-Admiral Sir Sydney Fremantle, who was commanding at Scapa Flow at the time, reported that except in the case of these twenty-four vessels, there was no prospect of salving the German ships without elaborate operations. The British Fleet had left Scapa Flow early on the morning of the sinking for torpedo practice, and the scuttling had been effectively accomplished by the time it had returned. The German rear-admiral, who took full responsibility, said he was under the impression that the armistice ceased at noon that day. The total number of the care and maintenance parties had been reduced from 4,700 to approximately 1,800. A few men were killed and wounded through their boats refusing to stop when ordered to do so. Mr. Long stated in Parliament on June 24th that the ships were interned, not surrendered, and the Admiralty had no power to guard them. Internment was not favoured by our naval advisers, but their advice was not adopted by the heads of the Allied and Associated Governments in Paris. The naval experts were therefore in no sense responsible for what had happened. Before the Germans left Scapa after being rescued, Sir Sydney Fremantle had them all paraded on the quarter-deck of his flagship "Revenge," and expressed to the admiral his "indignation at the deed which you have perpetrated and which was that of a traitor violating the action of the arrangements entered into by the Allies." In an interview with a *New York World* correspondent, on June 30th, Admiral Scheer rejoiced over the sinking, as he claimed that by it the stain of surrender had been wiped from the escutcheon of the German Fleet. The sinking of the ships, he said, proved that the spirit of the Fleet was not dead. In *The Times* next day Admiral Sir Percy Scott referred to this as follows:—"Opening a valve and letting a ship sink, when there was no one to stop it, and with an assurance of personal safety to the perpetrator, is considered by Admiral Scheer to be a brave action! With our knowledge of their mentality, this is exactly the opinion that we should have expected from a Hun Admiral. 'This last act is true to the best traditions of the German Navy.' It is!"

Naval Occurrences.

Preston and the Fleet.—On April 2nd the "Watchman," Commander John Fawcett, and another destroyer, were sent by Sir David Beatty to Preston, where they remained three days and were open to the inhabitants. The visit was in recognition of the generosity of the town in sending over 8,000 tons of fresh vegetables and fruit to the men of the Grand Fleet.

Warships' Caretakers.—On April 3rd the Admiralty ordered that caretakers for placing on board ships for disposal were to be ex-Navy men or ex-Royal Marines wherever possible, with pay at the following inclusive rates:—49s. to 52s. 6d., to cover all employment required for seven days a week. The rates were

fixed on the assumption that the men would have quarters on board for themselves and families, and that fuel and light would be supplied free of cost.

NAVAL WAR PROMOTIONS.—In a written answer, Dr. Macnamara stated in April that the number of Commanders in the Royal Navy holding the acting rank of Captain promoted to Captain between August 4th, 1914, and November 11th, 1918, was thirty-six, of whom nine were outside the zone of promotion. The number of Lieut.-Commanders holding the acting rank of Commander in the same period was forty-two, of whom eight were outside the zone of promotion.

ADMIRAL BEATTY'S FAREWELL.—Sir David Beatty took his leave of the officers and ship's company of his flagship, the "Queen Elizabeth," at Rosyth on April 5th, when he addresed them at length. He read his last general order to the Fleet, which began: "In success, in disappointment, and in monotony the spirit of the Fleet has been beyond praise, and the highest traditions of our great service have been upheld. I leave in full confidence that the spirit of the Grand Fleet will remain."

GRAND FLEET DISPERSED.—On April 7th the Grand Fleet officially ceased to exist. Dr. Macnamara made the following statement in reference to the Fleet's title:—"The Grand Fleet has never been used, as my hon. friend suggests, as a designation for His Majesty's ships of war as a whole. It has been used to designate our main naval force when it was concentrated under a single command and in a particular sphere of operations as one organization; but a large part of the Navy throughout the war has not been included in the Grand Fleet. It is not considered that respect for the associations connected with the name would be shown by using it with an entirely different signification, and one which, from a naval point of view, would be meaningless. In the opinion of the Admiralty, the proper designation for the Navy as a whole is His Majesty's Navy, or in contradistinction to foreign Navies, the British Navy, both of which designations have associations that cannot be equalled. The Admiralty see no reason why the designation 'Home Fleet' should be considered to suggest a Fleet in harbour, which is a signification which has never been attached to it. It suggests a Fleet whose normal cruising area is home waters."

NAVAL SHIPBUILDING STOPPED.—On April 8th Dr. Macnamara announced that the Admiralty had decided to cancel certain ships under construction, including the "Yeoman," "Zealous," "Zebra," and "Zodiac." The shipbuilders had been requested to stop all work at the earliest possible date, avoiding as far as possible sudden dislocation of labour.

SHIPS NO LONGER REQUIRED.—On April 9th the Admiralty notified the names of ten battleships, twelve cruisers and light cruisers, four torpedo gunboats, seventy-six destroyers, and forty-six torpedo boats which were not required for further service, and which were to be prepared for sale. A further list of twenty-one destroyers was also issued which were to be sold all standing as soon as possible, without the preparation in a dockyard prescribed by the existing dockyard regulations. Additions to these lists were made subsequently as more ships became available for disposal.

NAVAL ARCHITECTS' MEETING.—On April 9th the Spring Meeting of the Institution of Naval Architects was opened in London by the Marquess of Bristol. Sir Philip Watts, late Director of Naval Construction, read a paper on "Ships of the British Navy on August 4th, 1914"; and Sir Eustace d'Eyncourt, the present holder of that office, dealt with the naval construction during the war. He showed that some 2,000,000 tons had been added to the Navy during hostilities, at a cost of

probably between £250,000,000 and £300,000,000. The aggregate sum spent during the four years before the war on new construction amounted to approximately £60,000,000.

"WIVERN" LAUNCHED.—On April 16th the destroyer "Wivern" was launched by Messrs. J. S. White & Co., East Cowes. She was the 120th steel war vessel launched by the firm, the 72nd torpedo vessel, and 42nd ocean-going destroyer, in addition to a large number of smaller vessels. The "Wivern" is of 1,400 tons' displacement and 28,000 S.H.P. Her propelling machinery consists of Brown-Curtis geared turbines, and her oil-fired boilers are of the White-Forster type.

VISIT TO FRENCH PORTS.—On April 22nd British squadrons arrived on a ceremonial visit to French ports by our Ally's invitation. Sir Reginald Tyrwhitt took to Brest a light cruiser squadron composed of the "Curaçoa," "Curlew," "Danæ," and "Dragon," with the flotilla leader "Spenser" and eight destroyers. Vice-Admiral Sir Arthur Leveson took to Cherbourg the battleships "Barham," "Valiant," "Warspite," and "Malaya," with the light cruiser "Castor" and eight destroyers. In addition to entertainments at the ports, contingents of officers and men proceeded to Paris, where Admiral of the Fleet, Sir David Beatty, was present, and all were hospitably entertained by the French Government.

U.S. SECRETARY'S VISIT.—On April 24th Mr. Josephus Daniels, U.S. Naval Secretary arrived in England, receiving an official welcome on landing at Dover, having crossed in the American destroyer "Wickes." Admiral Sir W. Lowther Grant was attached to the Secretary during his stay. On April 26th Mr. Daniels inspected the interned German ships at Scapa, and on May 5th he motored from London to Portsmouth and visited the warships and naval establishments there. He left Plymouth on May 8th for Brest, stating that he had had two delightful weeks in England.

LORD FISHER'S SPEECH.—At the American Luncheon Club on May 5th, when Mr. Daniels was entertained, Admiral of the Fleet Lord Fisher made a speech. He related how King Edward once told him he was the best-hated man in the Empire, to which he replied: "Perhaps Your Majesty is right, but you have backed a winner." George Washington was the greatest Englishman that ever lived. He taught us how to rule our Colonies, that freedom was the thing to give them. Entertaining an American Admiral, Lord Fisher told how this officer made the best speech on Anglo-American relations he ever heard. The American said: "It is a fine old hen that hatched the American eagle." Referring to the League of Nations, Lord Fisher said they had gone and hashed it all by making the capital at Geneva instead of at Jerusalem. The Admiral of the Fleet concluded by saying he had no politics, but had voted consistently for both sides—for whoever gave most money to the Navy.

A GERMAN ADMIRAL ON JUTLAND.—On April 26th Vice-Admiral Paul Behncke wrote for the *Chicago Tribune* a review of Lord Jellicoe's book on "The Grand Fleet." This officer commanded the Third German Squadron at Jutland, in the "König," and was wounded. He considered the day performance of the British ships was admirable, but at night their handling was faulty. Admiral Behncke explained that the Germans did not attack the British ships at Scapa when the defence was admittedly defective because the German destroyers were unable to make long trips to the English bases unaided. The British, in the brilliant assault on the submarine base at Ostend and Zeebrugge, gave the only example in the whole war of a real spirit of attack.

CHAPLAINS AT JUTLAND.—At the unveiling of the R.N. Barracks Church, Portsmouth, on April 27th, of a window in memory of the Rev George Hayton Hewetson,

R.N., a former chaplain of the barracks, the Rev. R. G. Sadleir said that no branch of the Service had suffered more heavily during the war than that of the chaplains. At Jutland six Captains and a similar number of chaplains went down with their ships, but in addition the chaplains of the "Lion," "Barham," and "Chester" were among those who fell.

"DIOMEDE" LAUNCHED.—On April 29th the new light cruiser "Diomede" was launched by Messrs. Vickers at Barrow Island, and christened by Lady Doreen Long, wife of the First Lord. Her particulars are: Length over-all, 471 feet; beam, 46½ feet; deep load draught (mean), 16 feet 3 inches; displacement, 4,750 tons; Parsons geared turbines of 40,000 S.H.P.; twin screws; revolutions of shafts, full power, 275; speed at load draught 29 knots; oil fuel capacity, 1,000 tons; armament, six 6-inch and two 3-inch high-angle guns; with four triple 21-inch torpedo tubes.

NAVAL TRAIN DISCONTINUED.—On April 30th, owing to the reduction of numbers travelling to the northern bases of the Fleet, the Naval Train between London (Euston) and Thurso was discontinued. Senior naval officers and others desiring special trains or accommodation on ordinary trains for naval personnel were directed to arrange locally with the railways concerned, without reference to the Admiralty. Applications for special trains were only to be made when the numbers exceeded 200.

ADMIRAL TYRWHITT'S FAREWELL. — On May 1st Rear-Admiral Sir Reginald Tyrwhitt hauled down his flag in the "Curaçoa" on leaving the Harwich Force, which he had commanded throughout the war. He was rowed from his flagship by six naval captains to Shotley Pier. He addressed the officers and men of the "Curaçoa" before leaving, and also bade farewell to the officers of the barracks at Shotley. Sir Reginald during the war was blown up in, or shelled out of, something like six different flagships. His first ship, the "Arethusa," was sunk by mine, and among other flagships at various times were the "Conquest," "Centaur," and "Cleopatra."

"VENOM" RENAMED.—On May 2nd it was announced that the destroyer "Venom," built by John Brown & Co., of Clydebank, had been commissioned in the Clyde with the crew of the destroyer "Tintagel" for service in the Third Flotilla as tender to the "Woolwich," depôt-ship, in place of the "Tara." In accordance with Admiralty instructions, the "Venom" has been renamed the "Venomous."

SALVAGE DEPARTMENT CLOSED.—On May 5th the Salvage Department of the Admiralty was relieved of the responsibilities laid on it by the war, except in regard to such operations as were in progress at Zeebrugge and Ostend. Salvage plant and vessels not required for these operations was to be sold. The Department came into existence as a separate section in 1917, and since December of that year its chief, Commodore F. W. Young, R.N.R., had been responsible for all British salvage work, whether naval or mercantile.

DESTROYERS SOLD.—On May 6th advertisements were inserted by the Admiralty in the Press inviting tenders for the purchase of the obsolete destroyers "Moy," "Mohawk," "Ness," "Ettrick," "Ure," "Doon," and "Vulture," lying at Chatham Dockyard; and the torpedo gunboat "Antelope," lying at Immingham. Tenders had to be received by the Director of Contracts (Sales Branch) by Thursday, May 22nd. This was the first one of many similar advertisements for the sale of warships no longer required.

SHIPS FOR DISPOSAL.—On May 7th Dr. Macnamara stated in answer to a question that one vessel only, a light cruiser, had been sold, and that in India, since the Armistice, but 161 vessels were to be disposed of as soon as they could be cleared for sale. The ships were all obsolete, and those which were of any potential fighting value were sold to be broken up under bond.

SPECIAL ENTRY CADETS.—On May 7th Dr. Macnamara announced that the system of special entry cadets was being continued, and that, in addition, the Admiralty was considering the institution of special facilities to enable bluejacket boys and young sailors to train for commissions. Since the institution of the special entry scheme in 1913, up to February, 1919, 1,072 candidates came before the interview committees, of whom 408 came from the bigger public schools, 631 from the lesser public schools and grammar schools, 12 from council schools, and 21 from the lower deck of the Navy. On May 7th also, the "Carnarvon," Captain E. Wigram, left Plymouth for the west coasts of England and Scotland on her first cruise with special entry cadets.

RHINE FLOTILLA.—On May 9th the British Naval Flotilla on the Rhine was inspected by H.R.H. the Duke of Connaught. The twelve motor launches in the Flotilla were Nos. 8, 50, 229, 260, 287, 288, 291, 358, 473, 542, 569, and 576. The pennant of Commander the Hon. P. G. E. C. Acheson, D.S.O., Senior Officer, was flown in No. 291. On May 15th it was reported that an explosion had occurred in No. 229, one man being killed and two severely injured. The commander, Lieutenant J. W. Robinson, D.S.C., R.N.V.R., was also rather badly burned.

JERRAM REPORT PUBLISHED.—On May 10th it was announced that the Government had approved the decisions of the Admiralty arising out of the Report of Admiral Sir Martyn Jerram's Committee in regard to the pay of the men of the Navy and Marines. The additions to the pay and allowances represented a total annual cost of initially £4,447,000, and eventually £6,148,000. The increases in pay will cost annually £2,839,000. The new scales of substantive and badge pay were ante-dated to February 1st for all those in the Service on May 1st; and the changes in the non-substantive pay dated from May 1st.

PHYSICAL TRAINING.—It was announced in May that the Physical Training Branch of the Navy was to be known in future as the Physical and Recreation Training Branch (P. and R.T.), and Physical Training Instructors (P.T.I.s) were to be designated Physical and Recreational Training Instructors (P. and R.T.I.s). Commander Bernard T. Coote, R.N., formerly Superintendent of Physical Training, was appointed Technical Adviser on Physical and Recreational Training. Commander Coote severed his connection with Harrow School, where he was in charge of the gymnasium before the war, having been previously at Eton.

ROYAL CANADIAN NAVY.—On May 17th it was notified that the present policy of the Canadian Naval Authorities as to entry in the Military Branch of the Royal Canadian Navy is to enter only officers who have passed through the Royal Naval College of Canada, or officers of the Military Branch of the Royal Navy who have been through the ordinary naval training colleges, etc. They do not desire at the present time to transfer any R.N.R. or R.N.V.R. officers to the R.C.N.

AUXILIARY VESSELS.—On May 20th Dr. Macnamara stated that at the date of the armistice the number of the principal auxiliary vessels which attended on the wants of the ships of the Navy was 4,274. No troopships attended regularly on the Navy, but occasionally parties of naval ratings were conveyed to naval bases in troopships.

DECOY SHIPS COMMEMORATED.—On May 21st, in accordance with an Admiralty scheme to place a memorial tablet on board each merchant vessel that acted as a decoy or mystery ship during the war, Vice-Admiral Sir Alexander Duff, Assistant Chief of the Naval Staff, unveiled one on board the steamship "Lodorer," which served as the "Q.5," or "Farnborough," under Captain Gordon Campbell, V.C.

COST OF NAVAL EDUCATION.—On May 21st Dr. Macnamara, asked what was the annual expense to parents and guardians of a naval cadet at Osborne and Dartmouth, gave the following figures:—(1) Training fees, £75 a year, which the Admiralty have discretion to reduce to £40 a year in 25 per cent. of the cases; (2) initial cost of outfit, approximately £65; and (3) personal expenses, averaging £20 a year.

CAPTAINS, R.N.V.R.—On May 21st the first promotions to the rank of Captain, R.N.V.R., which was instituted by Admiralty order on April 5th, were announced. The number advanced was four, out of the six allowed, the officers promoted being Commanders the Hon. R. E. C. L. Guinness, the Marquess of Graham, the Duke of Leeds, and the Hon. C. A. Ward. These officers at present command the London, Clyde, Tyneside, and Bristol Divisions of the force.

KITE-BALLOON STATIONS.—On May 24th the Air Ministry were notified that the Kite-Balloon Stations at Shotley, Sheerness, Tipnor (Portsmouth), and Berehaven were no longer required. Sheerness was used as a training station, and Merifield (Plymouth) was ordered to take its place as a training station for kite-balloon observers from the Fleet. The stations at Caldale (Orkneys) and North Queensferry were ordered to be retained and kept manned for the present.

"R.34's" DELIVERY.—On May 28th the rigid airship "R.34" was formally taken over by the Admiralty from her builders and proceeded to East Fortune airship station. She was to have begun her flight across the Atlantic in June, but was despatched instead to cruise over the German coast, including Wilhelmshaven, Friedrichshafen, the Kiel Canal and Hamburg, and then into the South Baltic. It was at this time that the peace terms were awaiting signature by the Germans, and the flight was in the nature of a demonstration. It covered about 2,000 miles, and lasted from six p.m. on Tuesday, June 17th, to the early morning of Friday, June 20th.

LAUNCH OF THE "DURBAN."—On May 29th the light cruiser "Durban," of 4,750 tons, 29 knots, and six 6-inch guns, was launched by the Scotts' Company, Greenock, Mrs. Louis Botha performing the naming ceremony. Provision is made in the vessel for carrying an aeroplane in a hangar placed forward.

BASES DEMOBILIZED.—On May 31st, when the Auxiliary Patrol Base at Cromarty was closed, it was reported that some seventy bases of various kinds had been demobilized since the beginning of the year. These included fleet bases, bases for Auxiliary Patrols, headquarters of motor launches, C.M.B.s, and other small craft, transport bases, convoy and merchant ship control stations, D.A.M.S. offices, coaling bases, repair bases, air stations, and auxiliary naval hospitals.

NAVAL LOSSES.—On June 4th, when the First Lord was asked whether courts-martial were held into the loss of the "Pegasus" at Zanzibar, and the three "Cressys," and whether a memorandum was received by the Admiralty from Admiral Cradock in regard to his instructions and force, the reply was that no courts-martial were held. The captain of the "Pegasus" asked in July, 1915, for a court of inquiry or court-martial, but the Admiralty decided it was then too late to hold one. No memorandum was received from Admiral Cradock, who in correspondence did no more than point out certain obvious difficulties.

ENGINEER-ADMIRALS' ESTABLISHMENT.—On June 4th it was notified that a separate establishment would be instituted for officers of the rank of Rear-Admiral (E) and Captain (E), and that the numbers allowed would be 12 Rear-Admirals (E), or Engineer Rear-Admirals; and 50 Captains (E), or Engineer-Captains. The increase in the list was to be spread over 1919 and 1920.

BRAZILIAN PRESIDENT'S VOYAGE.—On leaving England after his official visit on June 6th, the President of Brazil was conveyed from Portsmouth to Lisbon, where he arrived on June 8th, in the battle-cruiser "Renown," Captain E. A. Taylor. This vessel was later selected to convey the Prince of Wales on his voyage to Canada.

AUSTRALIAN DESTROYERS.—On June 7th it was announced that, in accordance with the offer made to the Commonwealth Government of six modern destroyers (mentioned on page 321, May JOURNAL), the flotilla leader "Anzac" and the destroyers "Tasmania," "Tattoo," "Stalwart," "Success," and "Swordsman" had been selected to join the Royal Australian Navy. The "Anzac," of 1,600 tons, belonged to a class ordered in 1915; and the other five were of the "S" type, of 1,090 tons and 36 knots.

NAVY MEMORIAL SERVICE.—On June 13th the King and Queen attended at St. Paul's Cathedral a memorial service for the officers and men of the Navy who had lost their lives in the war. The Admiralty was represented by Mr. Walter Long and Admiral Sir Rosslyn Wemyss, and the Navy by many distinguished officers, including Lord Fisher, Lord Beresford, Sir David Beatty, Sir Charles Madden, and Sir Doveton Sturdee. The Archbishop of Canterbury delivered a short address.

ZEEBRUGGE CLEARED.—On June 14th the port of Zeebrugge, after being cleared by the Admiralty Salvage Department under the supervision of Commodore Young, was formally reopened, with fitting ceremony. Baron Deryckel, accompanied by Rear-Admiral C. F. Dampier, commanding the Dover Patrol, drove a tram-car across the new bridge crossing the canal just above the block of ships. Brigadier-General Sir George Gibb drove the first train on to the Mole, where it was received by Commodore Young.

NEW FLEET BASES.—On June 18th there were notified the new bases to be used by the squadrons and flotillas of the Atlantic and Home Fleets. Rosyth will be the main base of the battleships, battle-cruisers, light cruisers, flying squadron, and 1st and 2nd submarine flotillas of the Atlantic Fleet. The destroyers of the Fleet will have their main base at Port Edgar, the 3rd submarine flotilla at Devonport, and the 4th submarine flotilla at Blyth. The battleships, light cruisers, and destroyers of the Home Fleet will have their main bases at Portland. The bases of the 7th submarine flotilla, Atlantic Fleet; and of the "Princess Margaret" and 20th destroyer flotilla, Home Fleet, remained undecided.

SUB-LIEUTENANTS' PROMOTION.—On June 21st it was notified that, in view of the time which must elapse before all the officers then overdue for courses would be able to complete them, sub-lieutenants who attained two years' seniority prior to completing their courses and examinations for the rank of Lieutenant were to be promoted to acting Lieutenant from the date of attaining two years' seniority, provided that they were recommended as in all respects fit for promotion and had received their watch-keeping certificates. On completing satisfactorily their courses they were to be confirmed in rank with seniority according to the time gained in their examinations.

THE ALLIED MEDITERRANEAN COMMAND.—On the occasion of the abolition of the Supreme Commandership of the Allied Naval Forces in the Mediterranean, Admiral de Bon, Commander-in-Chief of the French Fleet in the Mediterranean, telegraphed to Admiral Sir S. Gough-Calthorpe, who was last year Commander-in-Chief of the British Naval Forces in the Mediterranean, saying that the French Navy will retain the pleasantest memory of the close collaboration accorded it by the British Forces. Admiral de Bon conveyed the greetings of the French naval forces to the British squadron, and thanked Admiral Calthorpe for the assistance he lent to Admiral Gauchet. In reply, Admiral Calthorpe thanked the French Admiral for his message, and expressed his pride on account of the close collaboration of the British sailors with their French Allies under their distinguished commander.

THE "BELGIAN PRINCE" CASE.—On June 23rd details were revealed in the Probate Court of the manner in which the German submarine which had sank the "Belgian Prince" under most brutal circumstances had been herself sunk a few days later. Leave to presume the death of Henry Hassan, formerly master of the "Belgian Prince," was applied for. The vessel was owned by Messrs. Furness, Withy & Co., and sailed from Liverpool on July 28th, 1917. Three days later she was torpedoed, and the "U"-boat ordered the ship's boat alongside. The captain and some of the crew were taken aboard. The submarine was afterwards destroyed in the North Sea by a British ship. The obvious presumption, said counsel, was that Captain Hassan was on board and perished. Mr. Justice Coleridge allowed the death to be presumed as on or since August 12th, 1917, when the "U"-boat was sunk.

INTERNATIONAL HYDROGRAPHIC CONFERENCE.—On June 24th there was opened in the Conference Hall of the Office of Works, by the First Sea Lord of the Admiralty, an International Hydrographic Conference. A banquet to those attending was given the same evening by Mr. Walter Long on behalf of the Government. Delegates were present from all the maritime nations except Germany, Austria, Turkey, and Russia. The chief subjects for discussion concern the construction and production of charts and other hydrographical publications, with a view to bringing into line the methods of the different hydrographic authorities. At present these methods vary considerably in different countries, and co-ordination in the best interests of international hydrography is much to be desired. The last conference at which such a discussion took place was at Petrograd in 1912, but Great Britain, the largest producer of charts in the world, was not then represented. In the present conference thirty-three delegates from abroad are taking part, including the Hydrographers of France, Norway, Sweden, Denmark, Holland, and U.S.A.

W.R.N.S. DEMOBILIZATION.—On June 25th Dr. Macnamara announced in the House of Commons that the demobilization of the Women's Royal Naval Service was to be completed on October 1st. The date of discharge noted on Service Certificates of W.R.N.S. ratings is to be the date to which demobilization gratuity (extension of pay) is issued.

SUBMARINE MEMORIAL.—On June 26th the Chaplain of the Fleet conducted the dedication service of the memorial erected in Shotley Churchyard to the officers and men of the "Maidstone," submarine depôt-ship, who lost their lives in the war. Mr. A. F. Ryan Tennison designed the memorial, some of the castings being executed by the men of the "Maidstone." Rear-Admiral C. F. Thorp, commanding the Eastern Coastguard District, and S.N.O., Harwich, addressed the officers and men present.

S. N. O., HARWICH.—On June 27th the appointment was announced of Captain H. A. Adam, of the battleship "Hercules," to be Senior Naval Officer at Harwich, and to command the Eastern Coastguard District, with effect from July 7th. Concurrent with this change, the Shotley Training Establishment was placed under the orders of the Commander-in-Chief at the Nore instead of the S.N.O., Harwich. With the departure from Harwich of the "Maidstone," the use of the title "Captain (S) Harwich" by the commanding officer of that ship was discontinued, and the title "Captain (S), 3rd submarine flotilla" used in lieu.

"CAPETOWN" LAUNCHED.—On June 28th the light cruiser "Capetown" was launched at the south yard of Messrs. Cammell Laird, Birkenhead, by the Hon. Mrs. Walter Long, daughter-in-law of the First Lord. The vessel was the last of the "C" type to be put afloat, and has a displacement of 4,190 tons, turbine engines of 40,000 horse-power, and a speed of about thirty knots, while her armament includes five 6-inch guns.

THE USE OF PARAVANES.—On June 30th the ship's company of the destroyer "Melampus" was awarded £130 prize bounty for sinking the German submarine "U.C.16" in the English Channel during a gale. Lieut.-Commander C. E. Hughes White, D.S.O., R.N., stated in an affidavit that on October 22nd, 1917, the submarine was sighted on the surface five miles away, moving westward at a high speed. The "Melampus" went after her at full speed and was not observed until within three-quarters of a mile. The submarine then dived rapidly, and the attackers just missed ramming her. Slipping both explosive paravanes, the "Melampus" towed them backward and forward in a broad zigzag course. Only one paravane dived, and thirty-five minutes later had hooked the submarine and exploded immediately. Lieutenant White then dropped three depth charges and there were explosions. While the "Melampus" was steering another zigzag course to ram the submarine if she reappeared, large blisters of air bubbles, each 17 to 20 feet in diameter, broke the surface. The second paravane was then made to dive slowly and fired from the ship. Oil was seen on the surface, but owing to the very high seas and the rising gale, it was impossible to stay on the scene, and nothing was picked up. The claimants had reason to believe the submarine carried about 23 officers and men and three supernumeraries.

THE "VICTORY'S" LOG SOLD.—On June 30th the private log of the Master of the "Victory" at Trafalgar, which was recognized to be of great historical value by the Admiralty Committee which reported in 1913 on the tactics of the battle, was sold by auction to Mr. James Buchanan. This gentleman announced in a letter to *The Times* that he had decided to present the document to the nation.

THE CHINA SQUADRON.—There was published in June the composition of the new force on the China Station. The battle-cruiser "New Zealand," after concluding her present tour with Lord Jellicoe will eventually become flagship. Meantime, the units on the Station will be as follows:—Light cruisers, "Hawkins," "Carlisle," "Cairo," "Capetown," and "Colombo." Destroyer leaders, "Bruce" and "Douglas." Destroyers, "Sabre," "Somme," "Scimitar," "Seabear," "Serapis," "Scout," "Scotsman," "Seafire," "Searcher," "Splendid," "Scythe," "Sepoy," "Sparrowhawk," "Simoon," and "Trinidad." Repair ship, "Diligence"; tenders, "Dew" and "Daybreak." Submarine flotilla, Nos. "L.1" to "L.9" and "L.15"; minelayers, "L.2," "L.14," and "L.17"; depôt-ships, "Ambrose" and "Pandora"; tenders, "Iroquois" and "Catspaw." Minesweeping sloops, "Geranium," "Mallow," "Marguerite," and "Hydrangea." Sloops, "Clio," "Cadmus," "Odin," and "Espiegle." River gunboats, "Scarab," "Gnat," "Bee," "Tarantula," "Mantis," and "Moth."

FOREIGN NAVIES.

FRANCE.

NEW COMMANDER-IN-CHIEF.—On May 26th Vice-Admiral de Bon hoisted his flag as Commander-in-Chief of the French Fleet in the battleship "Provence." He was succeeded as Chief of the General Staff by Vice-Admiral Ronarch, who was popularly known as the hero of Dixmude, where he commanded the French marines. It was announced that, simultaneously with this change, Vice-Admirals Lacaze, Maritime Prefect of Toulon, and Moreau, Maritime Prefect of Brest, would come to Paris as Inspectors-General. Vice-Admiral de Bon was the fourth naval Commander-in-Chief since 1914.

UNITED STATES.

"TENNESSEE" LAUNCHED. — On April 30th the battleship "Tennessee," of 32,000 tons, was launched at the New York Navy Yard. Her keel was laid in March, 1917. The armament is to consist of twelve 14-inch guns in four turrets, twenty-two 5-inch guns, four anti-aircraft guns, and two torpedo tubes. She is to burn oil exclusively, has the electric drive, and a speed of twenty-one knots. The sister-ship "California" is building at Mare Island.

ADMIRAL SIMS ON SUBMARINES. — Admiral Sims, addressing the Naval War College at Newport, Rhode Island, on June 2nd, emphatically endorsed the submarine as a weapon of warfare, thereby taking up a position contrary to the proposal made by the Peace Conference for the abolition of the undersea boat. He laid particular stress on the value of larger underwater craft having a cruising radius of two or three months. For scouting purposes he considered such a craft a dangerous weapon against other types of scouts. He said that the destruction of enemy submarines was most effective by Allied submarines, England especially being successful in this way.

ANTI-SUBMARINE WARFARE.—On a previous occasion Admiral Sims had told how the British and American Navies successfully met the submarine menace. Examination by divers, he said, showed that many of the crews of submarines destroyed by the Allies either killed each other or committed suicide after their "U"-boats were sent down. The Allied destroyers were equipped with a variety of listening devices, which enabled commanders to detect submarines under water. He declared that the only time credit could be given for sinkings was when the destroyed submarine could be found on the bottom and had been identified by number, or when a survivor or a piece of a survivor had been taken from the water. He said that German tallies, discovered after the surrender, showed that 205 "U"-boats were sunk by the Allies during the war.

AMERICA'S NAVAL EFFORT.—On July 4th, in an article for the American number of *The Times*, Mr. Franklin Roosevelt, Assistant Secretary, said that at the close of the war the United States Navy had permanently based in European waters 373 vessels. These included eight battleships, seventy destroyers, 120 submarine chasers, twelve submarines, and over fifty sea-going patrol vessels of various types. These were in addition to the cruisers and other vessels used as escorts in the Atlantic convoy. Furthermore, the United States Navy established a great number of seaplane stations on the British and French coasts, and co-operated with the British in the establishment of the Northern bombing group operating from the French coast. All told, the United States Navy, had 81,000 officers and men

serving in Europe at the cessation of hostilities, a total of 15 per cent. of the total American naval personnel. Many thousands were necessarily kept in home waters with the main battleship fleet, for it was deemed inadvisable by both the Admiralty and the Navy Department to send the main American battleship force across, because largely of logistic reasons—i.e., questions of fuel and supplies, which could be more usefully employed otherwise.

MILITARY NOTES.

(To the proclamation of peace, July 2nd, 1919.)

PEACE TERMS TO GERMANY.

On June 28th the preliminary peace terms were signed by the Allied and German representatives at Paris, and the text of the Treaty published. Military clauses were contained under Section I., Part V., aerial clauses under Section III., Part V., in the following articles:—

Effectives and Cadres.

159. German military forces to be demobilized and reduced as below.

160. (i) By March 31st, 1920, to 3 cavalry, 7 infantry divisions. After that date, the establishment to be 100,000 (including officers and depôts), of officers (including Staff) 4,000.

(ii) Divisional and Corps Staffs to be as per Table No. 1; 1 regiment of Cavalry, Infantry, and Field Artillery, 1 battalion of Pioneers, to have a depôt.

(iii) 2 Corps H.Q. Staffs. Other organizations forbidden. General Staff to be abolished.

161. Civilian administrative staffs to be one-tenth as budgeted for in 1913.

162. Customs officers, forest and coast guards to be as in 1913. Gendarmes, local police to be only increased as per population since 1913. None to be assembled for military training.

163. Within 3 months of the Treaty's coming into force, establishment to be 200,000, units not more than double those provided for in Article 160. At end of each subsequent 3 months, Allied military experts to gradually reduce establishments to that fixed in Article 160.

Armament, Munitions, and Material.

164. Till admission to League of Nations, as per Table No. 2, increase of 1/25th for small arms, 1/50th for guns, permitted for eventual replacement.

165. Guns, ammunition, equipment as per Table No. 3, periodically reduced as per Article 163.

166. Munitions as per Table No. 4. Stocks to be stored only at points notified to the Allies.

167. Fortress guns, etc., at time of ratification of Treaty, to be notified to Allies, and to constitute maximum permitted. Within 2 months afterwards, to be reduced to 1,500 rounds per 10·5 cm. or under, 500 rounds per higher calibre gun.

168. Manufacture of war material to be carried on only at places notified to, and subject to restriction by, the Allies. Within 3 months of Treaty's ratification all other establishments to be closed.

169. Within 3 months of Treaty's ratification all war material in excess of that permitted, or of origin other than German, to be surrendered.

170. Import or export of all war material prohibited.

171. Use, manufacture, or import of poisonous gases, etc., armoured cars, tanks, etc., prohibited.

172. Within 3 months of Treaty's ratification, the nature and mode of manufacture of all explosives or chemical preparations used during the war to be disclosed.

Recruiting and Military Training.

173. Universal compulsory military service to be abolished, recruiting only by voluntary enlistment.

174. N.C.O.s and privates to be enlisted for 12 consecutive years. Number of men discharged before that period not to exceed 5 per cent. of establishment laid down in Article 160 (i).

175. Officers retained, to serve to minimum age of 45: newly appointed, to serve for at least 25 consecutive years: retired, to take no part in military exercises, theoretical or practical. Number of officers discharged before expiration of service not to exceed 5 per cent. of establishment laid down in Article 160 (i).

176. Two months after Treaty's ratification, 1 military school per each arm to be allowed for training of officers for permitted units. Students to be in proportion to vacancies in officers' cadres, reckoned as per Article 160 (i). All other schools to be abolished.

177. Universities, schools, societies, or clubs to have no connection with military matters, or the use of arms.

178. Measures connected with mobilization forbidden. Such formations not to include supplementary cadres.

179. No naval, military, or aerial mission to be sent to any foreign country: or German nationals to join or be attached to any foreign service, the French Foreign Legion excepted.

Fortifications.

180. All works to be demolished west of a line to be drawn 50 kilometres east of the Rhine. Within 2 months of Treaty's ratification, such as are in territory not occupied by the Allies: the rest as directed by the Allied High Command. Within this zone no new works to be erected. Works on south and east frontiers to be maintained in present condition.

Air Clauses.

198. No naval or military air force permitted.

199. Within 2 months of Treaty's ratification, air force to be demobilized.

200. Allied aircraft to enjoy complete freedom of passage, transit, or landing until German territory evacuated.

201. For 6 months after Treaty's ratification, manufacture or import of aircraft or parts forbidden.

202. Within 3 months of Treaty's ratification all aerial material to be surrendered.

Inter-Allied Commissions of Control. (*Section IV.*)

203. The above clauses to be executed under the control of Inter-Allied Commissions appointed by the Allied Powers.

TABLE NO. I. STATE AND ESTABLISHMENT OF ARMY CORPS HEADQUARTERS STAFFS AND OF INFANTRY AND CAVALRY DIVISIONS.

These tabular statements do not form a fixed establishment to be imposed on Germany, but the figures contained in them (number of units and strengths) represent maximum figures, which should not in any case be exceeded.

I.—Army Corps Headquarters Staffs.

Unit.	Maximum No. authorised.	Maximum Strength of each Unit.	
		Officers.	N.C.O.'s and Men.
Army Corps Headquarters Staff	2	30	150
Total for Headquarters Staffs	—	60	300

II.—Establishment of an Infantry Division.

Unit.	Maximum No. of such Units in a Single Division.	Maximum Strength of each Unit.	
		Officers.	N.C.O.'s and Men.
Headquarters of an Infantry Division	1	25	70
Headquarters of a Divisional Infantry ...	1	4	30
Headquarters of Divisional Artillery	1	4	30
Regiment of Infantry ... ... (Each regiment comprises 3 battalions of Infantry. Each battalion comprises 3 companies of Infantry and 1 Machine-gun company.)	3	70	2,300
Trench Mortar Company	3	6	150
Divisional Squadron	1	6	150
Field Artillery Regiment .. .. (Each regiment comprises 3 groups of Artillery Each group comprises 3 batteries.)	1	85	1,300
Pioneer battalion ... ... (This battalion comprises 2 companies of Pioneers, 1 Pontoon detachment, 1 Searchlight Section.)	1	12	400
Signal detachment ... ... (This detachment comprises 1 Telephone detachment, 1 Listening Section, 1 Carrier-pigeon Section)	1	12	300
Divisional Medical Service	1	20	400
Parks and Convoys	—	14	800
Total for Infantry Division	—	410	10,830

III.—Establishment of a Cavalry Division.

Unit.	Maximum No. of such Units in a Single Division.	Maximum Strength of each Unit.	
		Officers.	N.C.O.'s and Men.
Headquarters of a Cavalry Division	1	15	50
Cavalry Regiment ... ... (Each regiment comprise 4 Squadrons.)	6	40	800
Horse Artillery Group (3 Batteries)	1	20	400
Total for Cavalry Division	—	275	5,250

TABLE NO. II. TABULAR STATEMENT OF ARMAMENT ESTABLISHMENT FOR A MAXIMUM OF 7 INFANTRY DIVISIONS, 3 CAVALRY DIVISIONS, AND 2 ARMY CORPS HEADQUARTERS STAFFS.

Material.	Infantry Division. (1.)	For 7 Infantry Divisions. (2.)	Cavalry Divisions. (3.)	For 3 Cavalry Divisions. (4.)	2 Army Corps Headquarters Staffs (5.)	Total of columns 2, 4, and 5. (6.)
Rifles	12,000	84,000		—	This establishment must be drawn from the increased armaments of the divisional infantry.	84,000
Carbines	—	—	6,000	18,000		18,000
Heavy Machine-guns ...	108	756	12	36		792
Light Machine-guns ...	162	1,134	—	—		1,134
Medium Trench Mortars	9	63	—	—		63
Light Trench Mortars ...	27	189	—	—		189
7·7-cm. Guns	24	168	12	36		204
10·5-cm. Howitzers ...	12	84	—	—		84

TABLE NO. III. MAXIMUM STOCKS AUTHORIZED.

Material.	Maximum No. of Arms authorised.	Establishment per unit.	Maximum Totals.
		Rounds	Rounds
Rifles...	84,000	400	40,800,000
Carbines	18,000		
Heavy Machine Guns	792	8,000	15,408,000
Light Machine Guns	1,134		
Medium Trench Mortars...	63	400	25,200
Light Trench Mortars	189	800	151,200
Field Artillery—			
7·7-cm. Guns	204	1,000	204,000
10·5-cm. Howitzers	84	800	67,200

Prisoners of War (Part VI., Section 1).

214. On Treaty's ratification, repatriation of war prisoners and interned civilians to be rapidly carried out—

215. —by an inter-Allied and German Commission.

217. Germany to pay cost and provide land and sea transport and staff ordered by Commission.

218. Prisoners undergoing sentences awarded after May 1st, 1919, to be repatriated without completing them. During interval, to remain under existing regulations.

219. Prisoners may be detained for offences other than those against discipline.

220. Germany to admit all liable to repatriation. Germans not desiring repatriation may be excluded, subject to their disposal as desired by Allies. No vexatious measures to be taken against such.

221. Repatriation of German prisoners to be conditional upon release of Allied nationals still in Germany.

222. All facilities to be given to the Commission. Any concealing the presence of Allied nationals to be punished.

223. On Treaty's ratification all articles, money, securities, or documents of Allied nationals to be returned.

224. Sums due for maintenance of prisoners reciprocally waived.

Graves (Section 2).

225. All graves to be reciprocally respected and maintained. Any Allied Commission for their identification, care, etc., to be given every assistance. Facility to be given to requests for the removal home of the bodies of those who fell or (226) died in captivity.

226. Lists, with full information, of those who died in captivity and of unidentified graves to be mutually furnished.

FRENCH-AMERICAN-BRITISH TREATY.

On June 29th the President of the United States, America, and the British Premier signed defensive Treaties at Paris assuring support to France in the event of attack by Germany.

PEACE PROCLAIMED.

On July 2nd the Royal Proclamation of Peace was read at different points in London.

PEACE TERMS TO AUSTRIA.

On June 2nd the aerial peace terms were handed at Paris to the Austrian delegates. They were:—

1. Aerial forces to be disbanded.

2. Allied aircraft to have freedom of passage, transit, or landing up to January 1st, 1923, unless before that date Austria be admitted to the League of Nations or permitted to adhere to the International Air Convention.

3. Manufacture or import of aircraft or parts forbidden for 6 months.

4. All aerial material to be surrendered within 3 months.

Military terms, etc., were reserved.

Peace terms to other enemy countries were incomplete at end of June.

"THE MILITARY EFFORT OF THE BRITISH EMPIRE."

The following approximate figures are given in "The Round Table" for June, 1919:—

(A) Numbers raised—

	Existing forces in May, 1914.	Since raised.		
United Kingdom	753,514		Canada	628,964
England		4,006,158	Australia	416,809
Scotland		557,618	New Zealand ..	220,099
Wales & Monmouth ..		272,924	South Africa	136,070
Ireland		134,202	Newfoundland ...	11,922
United Kingdom		4,970,514	Smaller colonies ..	12,000
Total	5,704,416 (a)			1,425,864(b)
		7,130,416		
Indian and coloured troops		... 1,524,187		
Grand total ...		... 8,654,467 (c)		

(a) Excluding } Auxiliary Services.
(b) Including }
(c) Including Royal Navy, Mercantile Marine, and Auxiliary Services at home. The total man-power raised exceeds 10,000,000; 250,000 women wearing an officially recognised uniform, were employed.

(B) Distribution—

	Maximum Strength	Total employed.		Maximum.	Total.
France	2,046,901	5,399,563	Mesopotamia ...	447,531	889,702
Italy	132,667	145,764	Egypt, Palestine	432,857	1,192,511
Salonica	283,021	404,207	Other Theatres...	293,095	475,210
Dardanelles .	127,737	468,937			
			Total ...	... ...	8 975,944(c)

(c) Including labour and l.c. units.

(C) Percentages:—

Men enlisted to total white male population, 24·07: to total white population, 11·37.

In United Kingdom, 25·36: less Ireland 27·28. England 24·02. Wales and Monmouth 21·52. Scotland 23·71. Ireland 6·14. Canada 13·48. Australia 13·43 New Zealand, 19·35. South Africa 11·12.

Of casualties (to male population), United Kingdom 10·91: less Ireland 11·78. Canada 6·04. Australia 8·50. New Zealand 9·80.

Of casualties (to men serving), in France 9. Dardanelles 9. Mesopotamia 12·50. Other theatres 10·50. Salonica 12. Egypt 12. East Africa 15. Italy 21.

Of casualties (to population), British Empire 4·51. France 4·32. Serbia 3·56. Belgium 0·78. U.S. America 0·22.

Enemy Strength on the Western Front, June—November, 1918.

The following additional information was published from documents at French G.H.Q., May, 1919:—

At the end of June, 1918, 207 enemy divisions on west front: 130 in line, 77 in reserve. Of the latter 31 fresh, 26 reconstituted, 20 tired.

Between July 15th—August 8th 76 enemy divisions engaged. Reserves depleted: Prince Rupprecht's brought from Lille to the Aisne.

By August 15th 120 enemy divisions engaged.

By September 25th 163 enemy divisions engaged. Now 68 in reserve (21 fresh, rest tired); 16 divisions broken up: in 50 of remainder battalions at half strength. Line shortened 125 miles, without relief to enemy.

October 11th, 44 enemy divisions in line, incapable of hard fighting. In reserve, 7 fresh, 15 tired (on quiet sectors).

October 24th, 84 exhausted enemy divisions engaged. In reserve 1, 10 tired (in Alsace Lorraine).

By October 26th 136 out of 191 enemy divisions engaged.

March 21st 186 in line, 78 in reserve (fresh).

May 27th	206	,,	81	,, (61 fresh, 19 tired).
July 15th	207	,,	81	,, (43 fresh, 26 reconstituted, 12 tired).
Sept. 26th	197	,,	68	,, (21 ,, 41 ,, 6 ,,).
Nov. 11th	184	,,	17	,, (2 ,, 5 ,, 10 ,,).

By November 10th most enemy divisions numbered 1,000—2,000 combatants; 80 Allied divisions in reserve.

July 15th enemy had about 12,500 field guns, 7,860 heavy guns.

November 10th enemy had about 9,000 field guns, 4,300 heavy guns, with low ammunition stocks.

The Argonne Battle, September 26th—November 11th, 1918.

During these operations General Pershing had, under his command, 22 American divisions numbering 631,405 men, with 4 French divisions and several artillery regiments aggregating 138,000 men. 3,928 guns opened the battle: firing 300,000 rounds before the infantry advanced. The enemy's line was penetrated to a maximum depth of 34 miles, and 640 square miles of territory liberated. Enemy losses were estimated at 100,000: 316 officers, 15,743 prisoners of other ranks, 468 guns, 177 trench mortars, 2,864 machine-guns were captured. Casualties amounted to 115,529 Americans, over 7,000 French.

On September 26th 508 American aeroplanes were available, 40 French, and an Italian night bombing group. By November 11th 475 planes were in use; 199 American planes, 22 balloons were lost: approximately 400 enemy planes and 50 balloons were destroyed. 142 American, 73 French tanks were employed: 22 of the former, 25 of the latter, were destroyed or badly damaged.

The First Battle of Ypres.

During April was published the first of the monographs drawn up by the German General Staff, dealing with the opening campaign of 1914 on the west front. With regard to the operations culminating in the battle of Ypres, it says: "We had not succeeded in making the decisive break through, and the dream of ending the campaign in the west in our favour in 1914 had to be consigned to its grave." The causes of failure at Ypres are said to be: (*a*) "annihilating effect of countless machine-guns"; (*b*) trench fortifications "equipped with every modern device"; (*c*) "every village having been converted into a fortress." In fact, (*a*) there were 2 machine-guns per company; (*b*) the earthworks had been hurriedly thrown up and supplemented by block houses. The criticism is a high compliment to the fire training of the Old Army.

Despatches.

Field-Marshal Sir D. Haig's despatch of March 21st was published on April 10th. It was divided into three parts: 1, the advance into Germany; 2, "features of the war"; 3, mentions.

1. The advance commenced on November 17th, and by December 16th the occupation of the Cologne bridgeheads was completed. 80,000 civilians in the liberated districts were fed from 6 to 7 weeks.

Under 2, the duration of the war was attributed to (*a*) our unpreparedness; (*b*) the collapse of Russia; (*c*) difficulties of Allied combination; (*d*) numbers engaged. Given the situation existing in 1914 our casualties were not excessive. It was urged that the sequence of events should be studied as a whole: the enemy collapse in 1918 was the logical result of the fighting in 1916-17. Other points dwelt upon were the advantage of the attack, the value of cavalry, and the increased use of mechanical contrivances. A number of statistics were given. In 1914 we had 1 machine-gun to 500 infantry, in 1918 1 to 20. At the battle of the Somme the proportion of artillery to infantry was one-half, by October 4th, 1918, 85 per cent. In 1914 we had 486 light and medium guns, in 1918 6,437, including many of heaviest calibre. The daily supplies for 1 division amounted to 200 tons: an ounce added to the ration to 75 tons. During 1918 175,000 tons were landed weekly, 10,500,000 men carried. The transport included 46,700 motor vehicles, 400,000 horses and mules. 1,500 miles of road, 2,340 of broad and 1,348 of narrow gauge railways, were maintained. 1,800 trains weekly on the broad gauge lines, 130 on the light, carried 400,000 tons. 36,000 tons were carried weekly on inland waterways. 9,000 telegrams, 3,400 letters were received or despatched daily at G.H.Q. High praise was given to the New Armies.

Lieut.-General Sir W. Marshall's Mesopotamian despatch of February 1st, was published on April 11th.

It gave details of the calls for other theatres made upon the Force. December, 1917—January, 1918, 7th Indian Division sent to Palestine. April—May, 1918, 3rd Indian Division, 3 siege batteries to Palestine, 1 siege battery to Salonica, 60 trained companies Indian infantry withdrawn (and subsequently replaced by recruits) for the formation of 15 new battalions. September, 1918, 12 "seasoned Indian battalions" to Salonica, and, just before the battle of Sherqat, 2 heavy batteries, 3,500 British infantry drafts to France. In addition "a constant drain" totalling 2,000 to 3,000 of all ranks to assist in the formation of new units in India and elsewhere.

On December 31st, 1918, Baku and Krasnovodsk passed out of the command.

Total captures during the war were 45,000 prisoners, 250 guns, vast stores, etc. When Mosul was taken the ration strength was 420,000, including labour battalions.

Lieut.-General Sir J. L. Deventer's despatch of January 20th was published on April 28th.

It stated that at the beginning of 1916 the enemy troops consisted of 2,700 Europeans, 12,000 Africans. By the end of the year they had been reduced by half. In November, 1917, they mustered 320 whites, 2,500 blacks. When they surrendered on November 12th, 1918, there were 155 Europeans, 1,168 Askaris. They had latterly still 1,600 long-service native porters, belonging to a tribe "renowned as the best porters in Africa and stout fighting men as well": and "frequently averaged 18 miles a day for considerable periods." One of our columns "did 1,600 miles in five months, and one battalion covered 1,000 miles in 97 days." "The enemy's methods were often brutal," but "the actual fighting was, on the whole, clean, and sometimes even chivalrous."

UNITED KINGDOM

Demobilization.

1. The following numbers were demobilized:—

	Demobilized.		Unfit.		Reserve.
	Officers.	Men.	Officers.	Men.	Men.
April 7th	71,238	2,016,515		112,962	114,351
May 8th	80,916	2,302,330	11,886	129,876	114,351
June 5th	90,582	2,436,867	14,161	144,185	114,351
June 24th	96,587	2,522,069	15,514	150,544	114,351

2. *Proportion of Officers.*—On April 16th the War Secretary said the proportion of officers to other ranks serving was: in July, 1914, 4·4 per cent., in October, 1918, 5 per cent., in April, 1917, 7·3 per cent. The reasons for the present high proportion were (*a*) detailed stock taking; (*b*) supervision of special services connected with demobilization; (*c*) officers' cadres were practically complete and few commissions were being granted; the strength in other ranks was much below establishment, and recruiting was proceeding busily.

Great improvement has recently taken place in the release of officers. The percentage of officers to other ranks demobilized was 2·91 in January, 2·87 in February, 4·63 in March, 7·32 up to April 9th. Otherwise stated, the ratio of officers to men demobilized was 1 to 33·25 in January, 1 to 33·83 in February, 1 to 20·34 in March, 1 to 12·63 up to April 9th.

The total of officers released was now over 3½ per cent. of the men, and the ratio was steadily improving.

3. *Appointments Branch, Labour Ministry.* — Dissatisfaction having been expressed with the Appointments Branch, Labour Ministry, the following statement was made on April 15th:—302,073 interviews had been given. 190,000 applications from employers had been received, of which 25,000 had been handed to the Employment Department, as not relating to professional or business men, and 165,000 release slips forwarded to commanding officers. It was estimated that 74,500 officers and an equal number of business men in the ranks had been demobilized. 75,000 applications had been received. 5,531 officers were on the waiting list. 6,100 vacancies had been filled, an average of 210 being so weekly. Difficulties arose from officers asking too much, employers offering too little. £404,000 had been granted for the expenses of the Branch for a year: it was expected they would not amount to so much.

On April 17th release slips were discontinued, and employers holding professional or business vacancies urged to communicate direct with officers.

On April 29th the Labour Minister said the Appointments Branch had placed (*a*) 5,000 demobilized officers and men in professional or business appointments; (*b*) 5,000 in training vacancies, with allowances up to £250 a year. It was alleged during the debate that the majority of officers (*a*) had been placed in Government offices, leaving 105,000 still unprovided for. A later statement gave 700 as the number of officers placed in Government offices.

On May 28th the Labour Minister said (*a*) 34,000, not 120,000, applications for training had been made by officers. (*b*) A total of 139,000 applications had been received. 10,731 officers were now on the books. Presumably the remainder had been provided for.

Up to June 3rd the Grants Committee, Labour Ministry, had received over 700 recommendations. 472 (203 officers, 260 other ranks) were examined. 337 sanctioned, 25 refused.

4. The number of ex-Service men drawing unemployment pay was: March 28th, 305,251 (and 1,012 women). April 29th, 350,000. May 28th, "over 400,000." By mid-June this number had decreased by 1,349.

On April 29th the Labour Minister said schools had been opened for training disabled soldiers. The men would enjoy "similar facilities" as those given to officers.

On May 2nd a Committee was appointed to enquire into the subject of unemployment benefits.

On May 29th the Labour Minister said:—

(*a*) 2,800,000 men had been demobilized since the armistice.

(*b*) 81 per cent. had been absorbed into industry. Not more than six complaints had been made of employers failing to redeem their pledges.

(*c*) No advantage would be gained by starting national factories.

(*d*) There were only 27,000 vacancies for employment throughout the country.

(*e*) A housing scheme had been launched for building 100,000 houses in the next twelve months, and 200,000 in the following. Approved sites had been secured for 76,000 houses: their early erection rested with local authorities.

(*f*) Unemployment was now on the decrease; there were under, instead of over, 1,000,000 cases. £7,500,000 had been granted for the repair of roads, £2,500,000 for local works such as gas and water, £15,000,000 for other schemes. This would provide useful employment.

By June 4th over 400,000 men, mostly suffering from some form of disability, were unemployed. Numbers of these having exhausted their 26 weeks' unemployment donation, it was extended for a further 13 weeks at reduced rates: 25s. for men, 15s. for women, with allowances.

On June 16th the Controller of the Training Department, Labour Ministry, said:—There were 720,000 pensionable men, of whom 350,000 would require training. 37,000 were on the books, 11,000 in training factories; there was accommodation for another 7,000. About 50,000 were in, or desirous of, training. Schemes were in progress for the employment of 30,000 to 40,000.

On June 24th, a Committee was convened to consider (*a*) the more extensive employment of disabled soldiers in Government departments, (*b*) in place of temporary women clerks.

On July 1st the Labour Minister stated 770,000 men were receiving disablement pensions. Of these, 43,500 were registered as unemployed; it was "estimated" 50 per cent. of the remainder had returned to their old employers, and "assumed" the balance had found new.

5. *Agriculture.*—On April 29th the War Secretary said:—Up to April 23rd, 28,000 of all ranks serving abroad had been demobilized for agriculture. The personnel employed on agriculture comprised (*a*) the Agricultural Corps, 70,000 strong last November; now numbering 20,000: (*b*) 9,000 men on leave, mostly drawn from cavalry and artillery. "It is these units that we have the greatest difficulty in supplying."

On May 7th 10 per cent. of the men (*b*) were directed to be retained for agriculture, all others withdrawn.

On May 12th 20 per cent. (*b*) and pivotal men, whose demobilization had been sanctioned before February 1st, were ordered to be retained.

6. *Peace Reductions.*—On May 29th the War Secretary said:—

(*a*) On the signing of peace the Army of the Rhine would be reduced from 10 to 6 divisions. 40,000 to 50,000 men, now guarding German prisoners, would be freed.

(*b*) If peace were signed in June all 1914 men now serving would be freed by the end of the month, all 1915 men by the end of July. This included Egypt, but excluded India. 30,000 "Derby" men (enlisted in 1916) would be released as early as possible.

(*c*) Out of 1,270,000 men now serving, the estimated reduction would be 330,000.

Royal Air Force.

On April 17th the Under Secretary flew round Windsor Castle to display to His Majesty the King the new flag sanctioned for the R.A.F. It resembles the White Ensign, but with a blue instead of a red cross, and in the centre the Crown and Bird in gold, representing the crest of the force.

On April 21st, Easter Monday, recruiting was opened for the R.A.F. The terms were as follows:—Age 18 to 26. Periods of enlistment: 4 years' Regular service, 8 years' Reserve: or respectively 5 and 7, 6 in each, or 8 and 4. Pay as at present rates until revised scale is published, bonus until further orders. Separation allowances as at present, subject to revision.

On April 24th the Air Ministry announced:—On November 11th, 1918, there were 337 aerodromes and landing places in the British Isles. 116 of these had been relinquished for cultivation, etc.: 100 would be temporarily required by the R.A.F.: the remainder, about 120, would be available for civil aviation on May 1st, when the regulations controlling it would be signed.

On May 14th the Secretary, R.A.F., said:—On November 11th, 1918, we had 20,000 sea and air planes, the monthly out-turn was 4,000. On March 31st, 1919, there were 15,700 in hand. 1,000 were obsolete, though suitable for civil aviation. Surplus and obsolete machines were being sold.

On April 23rd a "Synopsis of British Air Effort during the War" was published as a Parliamentary paper. Its chief points were:—

In August, 1914, the Air Service consisted of the R.N.A.S. under the Admiralty, the R.F.C. under the War Office. The separate organization led to expense, confusion, and delay. In February, 1917, a joint Air Board was formed: succeeded in January, 1918, by an Air Ministry. In April, 1918, the R.N.A.S. and R.F.C. were amalgamated as the R.A.F.

On August 13th, 1914, 4 squadrons (56 machines), R.F.C., proceeded to France. In November there were 6 squadrons, which were formed into 2 wings of 3 squadrons. Throughout 1915 fresh wings were formed, and administered by H.Q., R.F.C. The system, proving unwieldy, was replaced in January, 1916, by one of brigades.

On June 6th, 1918, the Independent Air Force was formed of 3 squadrons, 8th Brigade, shortly increased to 10. It was intended to enlarge it to 43 squadrons before May 1919, when hostilities ceased.

The first recorded combat was fought in September 1914, when 5 enemy planes were brought down. By mid-1915 air fighting was a recognized feature of operations. The tendency was towards engagements between patrols and larger formations of up to 80 machines. The squadron was, and remains, the tactical unit.

The first recorded photograph was taken in November, 1914, over Neuve Chapelle at an altitude of 3,000 feet. By November, 1918, the development of anti-aircraft fire had forced artists to a height of 22,000 feet.

900,000 hours were flown ("nearly 103 years").

The following table gives the comparative establishments in August, 1914, and October, 1918:—

	August, 1914.	October, 1918.
Personnel	R.F.C., 147 Officers, 1,097 men; R.N.A.S., 50 Officers, 350 men. Total, 1,844.	R.A.F., 27,906 Officers, 263,842 men. Total, 291,748.
Machines	R.F.C., 179; R.N.A.S., 93. Total, 272.	22,171.
Squadrons... ...	R.F.C., 4; R.N.A.S., 1. Total, 5.	198½, 5 flights (Western front, 84·5 flights, I.A.F. 10, 5th Group 3, India, 2; Italy, 4; Middle East, 13; Russia, ½; Home, 18; Naval units, 64.)
Training Depots...	R.F.C., 4; R.N.A.S., 1. Total, 3.	199 (Western front, 174; Egypt, 10; Canada, 15.)
Aerodromes ...	R.F.C., 4.	337 in British Isles.
Photos	R.F.C., 3 Officers, 3 men. Total, 5.	238 Officers, 3,000 men. Total, 3,230.
	October, 40 negatives taken.	23,247 negatives, 650,000 prints. Up to September, 3,287,826 prints issued in the field.

Results of Operations in the Air.

—	July, 1916, to Nov. 11, 1918.	January 1st, 1918, to November 11th, 1918.									
	Western front.	Independent Force.	Home Forces.	5th Gr'p & Naval Units	Italy.	Egypt.	Mesopotamia.	Salonika.	Palestine.	India (Aden).	Total.
Enemy aircraft accounted for, i.e., brought down or driven down	6,904	150	8	470	405	25	6	59	81	—	7,908
Our machines missing ...	2,484	111	—	114	44	9	13	8	24	—	2,810
Bombs dropped (tons)	6,402	540	—	662	50	43	25	130	74	80	7,945
Hours flown ...	889,526	11,784	—	39,122	25,206	7,022	7,852	13,417	21,848	579	1,016,346
Rounds fired at ground targets	10,278,182	353,267	—	—	222,704	50,937	107,563	193,354	735,530	7,527	11,858,137
Photographs taken	401,375	3,682	—	3,449	14,596	8,185	66,720	15,587	27,039	542	501,116
Enemy balloons brought down	258	—	—	—	—	—	—	—	—	—	258

NOTE.—Records are not available of results obtained by Expeditionary Force, Western Front, prior to July, 1916, or by 5th Group and Naval Units, or in Eastern Theatres prior to January, 1918. The absence of these records, however, will not materially affect the totals shown as regards enemy aircraft accounted for, our machines missing, or the weight of bombs dropped, owing to the comparatively recent growth in intensity of aerial fighting and the smaller number of aircraft engaged.

On June 14th the Chief of the Royal Air Staff said:—

(*a*) New conditions of service had been drawn up for all ranks.

(*b*) Officers holding temporary commissions would preponderate.

(*c*) They would be drawn from civil life and "asked to serve" for 3 to 4 years. Their pay would be the same as that of permanent officers. At the end of their service they would receive a gratuity of £75 for each year served.

(*d*) "A certain number" of naval and military officers would also be seconded for service.

(*e*) It was intended that the R.A.F. should be eventually controlled by officers "who had been taught from the earliest ages in the A.F. colleges. He was of opinion they would be able to live on their pay."

(*f*) "It was hoped to keep units together, and to give them a definite identity, so that they would be a home for officers and men, just as the famous British regiments were." Some of "the great squadrons who had made traditions for themselves during the war" would be commemorated by their titles.

(*g*) The basis of the organization was economy in officer personnel in peace, with rapid expansion for war. It would take 2 or 3 years to form.

Territorial Force.

On May 1st a conference was held of presidents and chairmen of T.F. Associations with the War Secretary. The War Secretary read a paper on the "Reconstitution of the T.F.," embodying the result of the conference of April 1st. He said: Reconstruction was urgent, because (*a*) of increased demands on the Regular Army. Reinforcements had had to be sent to Ireland and Egypt: to be held in readiness for India. (*b*) There was no Reserve. (*c*) Freedom of the Regulars depended on the existence of an efficient T.F. After discussion, the following conclusions were reached:—

1. The 14 Yeomanry brigades to be mounted.
2. The T.F. to be a replica of the Regular Army, with corresponding changes.
3. County Associations to be consulted in the appointment of officers to command units.
4. Sufficiently attractive terms of service to be announced without delay.
5. Men to join on the new attestations as privates: N.C.O.s to be selected later.
6. Nursing service to be retained.
7. A plan to be submitted on V.A.D. organization by the Red Cross Joint Committee.
8. The same class of gun to be issued to all T.F.A.
9. No units to be sent abroad until, on emergency, the passing of a General National Service Act.

Field-Marshal Sir D. Haig expressed his appreciation of the T.F. He said it had always been the General Staff view that the Regular Army and T.F. establishments should be the same. "This was not agreed to by the administrative branches. During the war we felt the effect of the error."

The War Secretary hoped another meeting might be held before November.

On May 8th the War Secretary stated 52 T.F. officers had been promoted to brigadier-general during the war.

Ministry of Munitions.

On June 24th the Deputy Minister of Munitions introduced an estimate of £185,000,000 for the year ending March 31st, 1920. He said:—

(*a*) £99,000,000 was for liquidating contracts running at the time of the armistice, £86,000,000 for supplies to other departments. The total expenditure up to end of last financial year was £1,834,507,941.

(*b*) "In the autumn of 1914 our soldiers were practically without suitable weapons . . . mortars, bombs, high-explosive shells." In August, 1915, 1,000 Stokes machine-guns were ordered. By the end of the year 6,000 trench mortars were sent out: during the war 20,000. "In the first

months of the war we had to supply our men with catapults. 3,000 were issued up to the end of 1915, and it was with these primitive weapons that the British soldier was expected to defend himself and to attack the enemy. The men who trod that Calvary and who remained alive, had nothing to learn of physical suffering or bitterness of spirit."

(*c*) Before the war our annual output of shell was 55,000: up to the armistice, 200,000,000.

(*d*) In August, 1914, we had 456 guns. During the war 23,430 were turned out, of which 9,170 were repaired.

(*e*) Up to June, 1915, 1,486 machine guns were supplied: by December, 1918, 250,000. A weekly output of 4,000 had been reached.

(*f*) During the German offensive, March—April, 1918, we lost 1,000 guns, 70,000 tons of ammunition, 4,000 machine guns, 200,000 rifles, 250,000,000 rounds small-arm ammunition, 700 trench mortars, 200 tanks. "Within a fortnight every loss was replaced."

(*g*) During the British offensive 2,900,000 rounds of gun ammunition were expended in one week of August, a maximum of 3,500,000 in one week of October. "On the day the British Army broke the Hindenburg line they fired 943,837 shells—a weight of 40,000 tons. That was a greater number than fired during the whole four years of the South African War." In 60 minutes the expenditure equalled a year's pre-war production.

(*h*) After Whit-Sunday, 1918, improvements in anti-aircraft guns, etc., "prevented any further German air raids on this country." The guns had now a range of 5 miles.

(*i*) Since 1916 the Department of Chemical Research had increased the production of gas from 5 to 370 tons weekly. "The British gas masks were undoubtedly the best of many, and the British Forces were never taken by surprise by the enemy, for however novel the form of gas he used, he had always been anticipated by the British chemists and manufacturers."

(*j*) £130,000,000 had been realized by the sale of surplus stores.

Recruiting.

On May 7th the War Secretary stated the number of re-engagements since January 3rd, and of enlistments for 2, 3, and 5 years from January 12th, was 88,662: a daily average of 864.

On May 29th he said there had been 170,000 enlistments, and 25,000 re-engagements from the Army of the Rhine, for the new voluntary Army.

On April 8th voluntary recruiting was opened for the Relief Force, North Russia, from amongst men who had served or were serving in the R.F.A., R.E., infantry, M.G.C., R.A.S.C., R.A.M.C., or R.A.O.C. The conditions were as follows:—(*a*) Fully trained men, fit for general service, of 19 years of age or over. (*b*) Pay, allowances, and bonus as in the Armies of Occupation. (*c*) Engagement for 1 years or such shorter period as may be required. No man to be kept longer than needed on this special service. (*d*) Demobilized or discharged men to retain the substantive or acting rank held when they left the Colours. (*e*) At end of engagement 2 months' furlough on full pay, or any longer period to which entitled. Recruiting was to be closed as soon as the requisite number was obtained. A specially designed badge, consisting of a white star on a blue ground 3 inches square, was to be worn on the upper sleeve.

On May 13th the first party, 1,500 of all ranks, sailed from Newcastle.

On May 6th men of under 37, serving on a (Regular) during-the-war engagement, were permitted to extend their service up to 12 years.

On May 12th enlistment was decided of lower-standard men (*a*) for garrison duties with the Armies of Occupation, (*b*) for cemetery work with Labour Corps in France.

Discipline.

On May 13th the following amendments were made in the Army Act, 1919:—

Section 46.—G.O.C.s empowered to deal with charges against officers below rank of Major by (*a*) dismissal, (*b*) court-martial, (*c*) summary disposal. In (*c*) punishments to be forfeiture of rank, reprimand. Officers to have option of court-martial.

Section 156A.—Fine up to £20 or 3 months' imprisonment for illegally wearing or supplying decorations other than regimental badges.

Section 14.—Army Council to register carriages and animals. Owners to submit return when required, under £50 penalty.

Section 131.—Penal servitude to be carried out in country of enlistment.

Section 156.—Buying or receiving military necessities an offence.

Section 173.—T.F. officers (*a*) on active list, (*b*) of Reserve, when on duty, subject to military law.

Section 179.—All ranks R.A.F. amenable to general court-martial whilst attached to military forces.

Pensions.

On April 9th the Pensions Minister announced that, in order to decentralize administrative work, thirteen regional headquarters would be set up. Awards, medical services, and curative training would be entrusted to them, and an appeal tribunal attached. These steps were shortly taken.

On May 15th, before the Select Committee on War Pensions, the Pensions Minister said sanction had been applied for to the Treasury for the following alterations in the warrant:—

(*a*) Maximum retired pay for incapacitated officers recommended for non-institutional treatment.
(*b*) Allowance up to £50 for the wife, or up to £40 for the dependent relative, of such officers, provided there was pecuniary need.
(*c*) Maximum treatment allowance of £1 instead of 10s. weekly.
(*d*) Pensions of officers wounded in previous wars to be brought up to the scales now obtaining.
(*e*) A temporary 20 per cent. bonus on such pensions.
(*f*) A flat rate of 7s. 6d. to men under treatment or training, living at home, in lodgings, etc.
(*g*) Free issue and repair of surgical appliances to officers.

(*a*), (*b*), (*c*) were intended to put officers in an equivalent position to men, and were urgent.

The improvement of pensions of widows of officers dead from disease was under consideration.

On May 29th pensions were granted, under three categories, to parents of men killed in the war. The amounts varied from 3s. 6d. to 30s. weekly.

On July 1st Field-Marshal Sir D. Haig handed to the Select Committee on Pensions a statement of evidence emphasizing the following points:—

1. A single authority was required to co-ordinate the three Ministries—War, Pensions, and Labour—affected. This was foreseen early in 1915. Nothing had been done, with the result that many officers were left penniless on discharge.

2. Appointment of a combatant military officer as assessor on medical boards.
3. "Inhuman" action of the War Office in putting officers on insufficient half pay.
4. Distress caused by delay in Government Departments.
5. More generous provision for wives and children of officers and men.
6. Inadequate total disability rates for officers and men, and education of their children.
7. More generous treatment of sufferers from gas poisoning, shell shock, and neurasthenia.
8. Attitude of trades unions.
9. "Scandalous treatment of those who had earned pre-war pensions."

Land Settlement.

On May 7th, at Dublin, the Viceroy received a deputation representing 200 demobilized soldiers in County Limerick. Most of them desired 15 acres and a £10 grant. He said provision had been made for 94 ex-Service men: in 57 cases land had been allotted to them: in 37, where that was impracticable, to their parents or near relatives.

By May 13th County Councils had acquired 15,000 acres, and were negotiating for 83,000. The Board of Agriculture had acquired 12,267 acres, and was negotiating for more. 122 men were settled on holdings averaging 10 acres. At Bosbury, Herefordshire, 750 acres had been given by a landowner for the settlement of officers. 11,000 applications had been received from ex-Service men, for 250,000 acres; 80 per cent. of the applicants were of "the right sort." The Board of Agriculture had vacancies for posts of Commissioner at headquarters and 6 Commissioners.

On May 28th the President of the Board of Agriculture, after thanking the Duke of Sutherland for his gift of 12,000 acres, said:—

1. 12,000 applications had been made by ex-Service men for land in England and Wales, representing an average of 218,000, or an average of 18 acres per applicant. Less was often required.
2. 88 per cent. of the applicants had been interviewed and approved by the County Councils.
3. Were 10,000 out of the 12,000 applicants approved, 120,000 acres would be required on a 12-acre basis. County Councils had acquired 23,000 acres, the Board 12,260. The former were negotiating for 80,000, the Board for 10,000. This would approximately meet the demand.
4. Most of the land was not available till Michaelmas, 1920. It was hoped to obtain possession of 80,000 acres by then.
5. Another serious difficulty was the building of cottages.
6. In Scotland 24,394 acres had been obtained under various Acts, 12,710 by gift. Settlers would be placed as early as possible.
7. Three classes of training were being given. In (*a*), for men of high educational qualification, 32 scholars had been selected. In (*b*) for future farmers and bailiffs, 713 officers and men had been approved, 368 were in training. In (*c*), for work on farms at district rates, only 200 had applied.

By June 20th the Board of Agriculture had acquired 16,000 acres, County Councils 35,055; 11 settlements had been formed.

On June 30th the Minister of Health said:—12,000 acres had been sanctioned for housing, which would suffice at 10 acres for 120,000 houses. Plans were ready for 17,720 more. 2,538 applications for sites had been received, the number was increasing weekly.

Prisoners of War.

On April 8th the War Secretary stated: (*a*) the number of prisoners unaccounted for up to April 7th was 1,896; (*b*) the motor ambulance parties searching for prisoners in Germany had finished their work. They had found 121. Evidence of death had also been discovered. Major-General Sir R. W. Ewart was in Berlin making a search of the records.

On April 30th a Parliamentary paper stated: 2,900 prisoners were unaccounted for in February: 1,662 by April 23rd. Alleged cases of prisoners being in German salt mines had so far proved unfounded.

On May 20th the Under-Secretary for War stated 1,763 cases had been accounted for, 1,299 were still unsettled. "Black lists" of Turkish officials responsible for the ill-treatment of our men had been presented to the Turkish Government. Replies were awaited.

German Prisoners of War.

On April 30th the War Secretary said: 96,000 German and Austrian prisoners were detained in this country. 40,500 were employed in agriculture, forestry, cement production, and quarrying. Of the remainder, there were 9,500 sick and unfit, 21,000 officers and surplus N.C.O.s, 3,500 on camp duties, 11,000 awaiting embarkation for France, 11,500 unemployed. 7,233, including seriously ill and medical personnel, had been repatriated since the armistice.

On May 13th the War Secretary said 3,000 were employed in filling in trenches, etc., dug on agricultural land, where civilian labour was not available.

On July 1st the Labour Minister stated 31,595 were employed (22,146 in agriculture, 8,821 in military work, 628 "by a company by agreement with the Trade Unions").

British War Graves.

On April 10th it was stated by the Imperial War Graves Commission that two designs for memorial stones, differing only slightly in detail, have been adopted after reference to the various regiments. Each stone will bear the crest of the unit to which the dead man belonged, together with his name, rank, regiment, and date of death. No difference will be made between officers and men, nor will any distinction of rank be attempted in the disposition of the cemetery. The inscription at the base will be chosen by relatives of the dead.

The number of properly registered graves in France and Belgium is over 350,000, and there will be more than 1,000 cemeteries in those countries. Thanks to the chivalrous action of their Governments, the ground "will be for ever England." Italy and Greece are also taking the same course.

It is intended to plant pyramidal oaks around the cemeteries, and of flowers there will be plenty. This part of the work is being supervised by the Director of Kew Gardens.

On April 29th the War Secretary said: there are 160,000 isolated graves: 150,000 men are employed in gathering these into, and caring for, the cemeteries.

By May 25th 373,351 graves had been identified and registered. Of 154,823 other burials reported, 2,125 had been identified and registered during the past month.

Education.

By the beginning of May about 40,000 of all ranks of the Army of the Rhine had passed through elementary, secondary, and technical training classes: or

through six weeks' courses at the Technical and Commercial College, Cologne, and the Science and Agricultural College, Bonn. A Technical and Engineering College was opening at Siegburg. 400 civilian instructors were being imported.

On May 14th an Army Order amended previous schemes. It stated: "No man need, in the Army, fall behind his civilian fellows, or be debarred from his own advancement by lack of education." Various provisions were made to that end. The soldier was to receive instruction for between 4 to 6 hours weekly as part of his military duty.

On June 11th a Conference assembled "for the discussion of educational problems which have presented themselves to the Imperial Education Committee, War Office, as a result of the experience gained in the working of the educational schemes within the British Army and the Forces of the Dominions."

R.M.C., Woolwich.

On May 20th an Army Order announced that a limited number of cadetships would be filled by specially selected W.O.s, N.C.O.s, and men who had served overseas prior to November 11th, 1918. Candidates must be over 17½ and under 21 years old on July 1st or November 1st for the examinations to be held in those months.

Decorations for Prisoners of War.

On May 7th an Army Order removed restrictions on recommendations for reward of officers and men taken prisoner. Such services are to be considered irrespective of date, provided that the individual has been absolved by competent authority from blame in the matter of capture. On that condition, (*a*) exceptional services rendered while prisoners of war or interned, (*b*) exceptional gallantry in escaping or attempting to escape from captivity, are also eligible. All may receive distinctions normally reserved for "services under fire."

Medals, Dress, etc.

On April 9th the ribbon for the war medal to be issued to all Allied troops was announced. It was to have an orange centre, with white, black, and blue stripes on either side.

On April 10th the War Secretary stated that a silver rosette on the 1915 medal ribbon had been sanctioned "for 1914 men of the original Army, who took part in the fighting and were not distributed among a mass of people who never went beyond Havre."

On April 24th a Committee was formed, President, Lieut.-General Sir A. J. Murray, K.C.B., C.V.O., D.S.O., to investigate and report on uniform for the after-war Army. The Committee was empowered to take evidence, and to consider all regimental claims.

On May 30th it was directed that officers need not provide themselves with any uniform other than service dress, or khaki drill for hot climates.

Commemorative Scrolls.

On June 21st the distribution was announced of the commemorative scrolls recently designed for issue to the next-of-kin of men fallen in the war. Memorial placques, intended to accompany them, will be issued as early as possible.

War Trophies.

By April 25th, 351 field guns, 809 machine-guns, 1,550 rifles, and 1,300 other trophies had been distributed. Only a portion of those captured on the western front, and very few from the Middle East, had been received.

The War Trophies Committee ruled that (*a*) substantiated claims must be authorized by the War Office, (*b*) trophies so allotted go to a recognized public body or museum, (*c*) preferably to the birthplace of a soldier who has gained the V.C.

Canteens.

On May 1st the Expeditionary Force canteens were taken over by the Navy and Army Canteens Board. Total sales in France amounted to £38,537,511: during 1917-18 the cinema department netted £53,569. Officers rest houses' and messes were opened in March, 1917. The receipts for the first three months were £39,908: from July to December, 1918, £388,602. An account of the work accomplished has been written by Captain E. Vrederburg, late 10th London Regiment.

Sale of Animals.

On April 26th the sale of horses and mules was temporarily suspended at home. 88,772 horses had fetched £3,320,028 8s. 8d., an average of £37 17s. 11d. 2,220 mules had fetched £42,555, averaging £19 3s. 4d. The prices realized exceeded expectations. A contributory cause was the soundness and excellent condition of the animals. Sales abroad were as follows:—

France: 103,139 horses at £39 17s., 39,508 mules at £30 6s. 2d.

Egypt: 2,134 horses at £32 8s. 8d., 6,833 mules at £33 7s. 10d., 21,406 camels at £22, 10,836 donkeys at £9 5s.

Salonica: 4,601 horses at £43 3s., 16,052 mules at £41 4s. 5d.

Mesopotamia: 2,738 horses at £16 3s. 8d., 1,629 mules at £45 7s. 4d.

Up to May 7th, 91,819 horses, 2,805 mules, had been sold at home, at an average price of £37 17s. 2d. and £22 3s. 6d. respectively. The total sum realized in all theatres was £13,429,099.

Between May 1st—7th there were sold at home 285 riding horses averaging £31 2s. 2d., 49 light draught at £54 4s. 3d., 29 heavy draught at £102 4s. 11d., 12 mules at £33 1s. 6d. 520 mules were sold to Portugal at £33 1s. 6d.

Field-Marshal Sir D. Haig at the Mansion House.

On June 12th His Majesty the King conferred the Order of Merit upon Admiral Sir D. Beatty and Field-Marshal Sir D. Haig. They subsequently received the Freedom of the City of London. In speaking at the Mansion House, Sir D. Haig said:—

1. *Army Organization.*—"My message to you, and, through you, to the Empire, is . . . . to set up forthwith the organization of a strong Citizen Army on Territorial lines, which shall ensure that every able-bodied citizen shall come forward when the next crisis comes, not as a willing, patriotic, but militarily ignorant volunteer, but as a trained man. There must, in addition, be our highly-trained professional Army . . . . training schools, and Staff colleges . . . . Above all, however, we need to organize at once our democratic Citizen Army."

2. *Employment of Demobilized Officers.*—"The need has not yet been met—far from it. . . . It is not possible to do everything by setting up Departments. We already have an Appointments Department which is doing its best to deal with an almost overwhelming problem. It is above all a case for the effort of individuals, that by their good will and cumulative effort, the great mass of most admirable material now wasting may be received back into profitable employment."

An Echo of "1914."

On July 2nd the War Secretary said:—Officers on the active list could not be permitted to publish replies to criticism upon their conduct. Publication was being

considered of authentic documents bearing on naval and military incidents, annotated and explained by the General Staffs of the Navy and Army.

"Victory Marches."

Following the march of the Household Cavalry and Guards Divisions through London on March 22nd, 5,000 Australian troops, representing the Australian Expeditionary Force, marched through London on Anzac Day, April 25th, and on May 3rd 5,000 Australians, 1,000 New Zealand, and 500 South African troops. On each occasion they passed before His Majesty the King at Buckingham Palace.

Trooping the Colour.

On June 3rd this ceremony was revived in Hyde Park in the presence of His Majesty the King. Bands wore full dress, troops service dress, and the men of the Household Cavalry who had served as machine-gunners paraded as the Guards Machine Gun Regiment.

Military Tournament.

On June 26th His Majesty the King opened the Military Tournament at Olympia. The proceeds are to be devoted to the widows and dependents of the "Old Contemptibles." The French Government sent a picked contingent of men, distinguished in the war, from the Saumur cavalry school. It was not possible to accept the kindly proffered aid of others of our Allies.

Australia.

Aviation.—During 1915 four flying officers, 60 men, served in Mesopotamia. In March, 1916, the first complete squadron left for Egypt. During 1917 three squadrons were sent to France, and 4 training squadrons formed in England. During 1918 a central flying school was formed at Melbourne. At the armistice the corps numbered 250 pilots, over 3,000 men.

Canada.

Aviation.—800 officers and cadets were enrolled in the R.F.C. and R.N.A.S. before a training school was formed in Canada. Since then, 4,000 cadets, 2,750 men, were commissioned. Over 8,000 officers served during the war. At the armistice 2,500 were serving in the R.A.F., 1,200 cadets training in Canada or England. 350 machines were being turned out monthly.

On May 8th the Minister of Justice introduced a Bill disfranchising defaulters from military service for 15 years, and preventing their holding Government appointments or entering Parliament during that period.

On May 12th the Minister of the Interior introduced a Bill dealing with land settlement. It erected a Soldiers' Settlement Board, empowered to (*a*) acquire privately owned land, (*b*) issue free grants up to 160 acres, with loans up to £1,500 repayable by annual instalments at 5 per cent. The measure applied to Imperial, Canadian, or Colonial sailors and soldiers who served in the war outside the country of their enlistment.

New Zealand.

Aviation.—300 officers served in the British flying services during the war. At the time of the armistice 142 cadets were training. The Dominion presented 6 aeroplanes, and lent 2. Two schools of instruction have been formed at Auckland.

Up to March 31st, 473,000 acres of land had been acquired, and 1,133 men settled. 430 had been helped to buy property in towns, repayment being made by instalments spread over 20 or 25 years.

In May the pension list was £1,700,000, and expected soon to reach £2,000,000.

Union of South Africa.

Aviation.—About 3,000 officers served in the British flying services during the war in France, Egypt, Palestine, and Africa.

On May 21st a Select Committee passed a draft Bill for the benefit of ex-soldiers and their dependents. It included provision for Dutch burghers and all engaged in previous wars.

On June 3rd the acting Premier promised a Bill to provide a civil government for South-West Africa. "It was a very fine big territory." The claims of returned soldiers would have preference.

India.

In February Amir Habibullah of Afghanistan was murdered. After some unrest he was succeeded by his third son, Amanullah. The new Amir entered into correspondence with the Bolshevists, one probable result being their advance during May on Merv and Kusht. On

May 8th, Afghan troops crossed the frontier at three points N. of the Khyber Pass.

May 10th, British cleared Ashrufal Khel (Lundi Kotal).

May 11th, British occupied Dakka fort.

May 17th, British cleared hills N. of Dakka.

May 26th, British advanced posts concentrated Thal—Idak—Murtaza.

May 27th, British captured Baldak fort (opposite Chaman), cleared heights N. of Thal (Kurram Valley).

June 2nd, letter of May 28th from the Amir received at Peshawur, proposing "an honourable peace."

June 4th, provisional armistice offered on the following terms. 1, British to maintain present positions. 2, Afghans to withdraw 20 miles. 3, British aeroplanes to reconnoitre, without bombing. 4, Afghans to "discourage" frontier tribes from hostilities.

During May the men awaiting demobilization volunteered to remain, and demobilization was suspended. Aircraft bombed Jellalabad, Kabul, etc.

Mesopotamia.

During May a Kurd chief captured some British. On June 18th the Bazyan Pass (170 miles N. of Bagdad) was captured, cavalry occupied Suleimanie and liberated the prisoners.

On November 11th, 1918, the number of British (excluding Indian) troops was 91,000: on March 15th, 1919, 61,000; on May 24th (last available return) 26,291, with a percentage of 3·6 sick.

United States, America.

Medal.—In April a Victory Medal was authorized. In addition to clasps for actions, there were five clasps for service in as many different countries.

Casualties.—On May 1st the total of deaths during the war was reported as 111,179. 53 per cent. were from disease, 41 from wounds, 6 from other causes. 12,000 deaths from disease occurred since the armistice. On June 11th a revised

casualty list gave :—32,842 killed in action, 13,554 lost at sea, 4,640 died of wounds, 23,200 died of accidents, 208,223 wounded (of whom 85 per cent. returned to duty), 2,993 prisoners, 4,534 returned prisoners, 6,013 marine casualties. Total 290,819.

Demobilization.—Between May 1st—25th 7 divisions (235,000 men) left France for home, 8 divisions were ready to embark, 5 divisions remained in the Army of Occupation. Total embarkations were 330,000.

Between May 1st—31st 62,000 men applied to the Employment Bureau for positions, over 40,000 were found employment. 30 per cent. of the first 1,000,000 discharged applied for employment.

Strength.—On June 10th the strength of the Army was 1,232,625 of all ranks. 644,000 were in Europe, 460,000 homeward bound. 57,000 officers, 1,292,000 men had returned from France.

Future Establishment.—On June 8th the Military Committee completed the Army Bill. It provided for an average establishment of 21,000 officers, 400,000 men—a reduction of 7,000 officers, 109,000 men on that previously proposed. The estimated cost was £160,000,000 : a saving of £60,000,000. On June 16th the War Secretary again urged a 5,000,000 establishment.

Belgium.

Casualties during the war were returned as follows. Up to September 28th, 1918, 46,554 killed and missing, 55,828 wounded : total 102,382. From September 28th to November 11th, 925 officers, 29,056 men (including 253 officers, 3,083 men, killed). Grand total, 132,353.

During April the British handed over a fully equipped hospital of 300 beds. It forms an annexe to the military hospital at Brussels.

Czecho-Slovakia.

Early in May estimates were passed for £25,580,000 for 14,000 volunteers, 243,000 regulars, 28,000 horses.

France.

Aviation.—Casualties, August 4th, 1914—November 11th, 1918. In Army zones : 1,945 pilots and observers killed, 1,416 presumed dead, 2,922 wounded. In interior zones, 1,927 killed and wounded. On December 1st, 1918, the strength was 19,219.

Officers' Pay.—On May 23rd estimates were introduced providing for the following increased rates of pay :—Monthly, Sub-Lieut. from 360 to 501 francs; Lieut., 481 to 702; Captain, 574 to 951; Major, 675 to 1,152; Lieut.-Colonel, 750 to 1,251; Colonel, 990 to 1,500; General of Brigade, 1,200 to 1,890; General of Division, 1,165 to 2,490; Marshal, 2,400 to 3,840. Daily, N.C.O.s of over 5 years' service, 2 to 6; Corporals and men of the same, 1 f., 20 c.

Demobilization.—On the signature of the preliminary peace terms it was hoped to demobilize the 1907-9 classes within 30 days, the 1910-11 classes a fortnight later, and the 1912-17 reserves by degrees.

Service in Russia.—On June 18th it was stated in the Chamber that, of 400,000 Allied troops in Siberia, 500 were French, retained as instructors. Of 40,000 Allied troops in North Russia, 2,000 were French. Of three divisions on the Dniester, one had been withdrawn, two were being so.

Men Missing.—On June 19th the Under War Secretary said :—At the date of the armistice 300,000 men were returned missing. These were mostly dead. A small number did not wish to return to France. Of those missing in Lorraine, 15 to 18 per cent. had been traced, 75 per cent. by the Graves Commission as having been killed in the battles in Champagne.

At the end of June, casualties during the war were returned as 1,039,600 killed, 245,900 missing, 2,560,000 wounded: 67,000 native troops killed or missing, 140,000 wounded. 7,935,000 men were mobilized in France, 475,000 natives in the colonies.

Marshal Joffre visited England late in June, and was decorated by His Majesty the King with the Order of Merit.

GERMANY.

Early in April a Czecho-Slovak delegation in Paris reported that troops were being concentrated on the line of the Niemen. Over 50 recruiting centres had been opened in the eastern provinces, and a system of "peaceful picketing" introduced at the railway stations. An average of 500 men were secured daily at each centre. The pay offered was 5 marks a day. Nine new factories had been erected, turning out guns, ammunition, etc. There was no want of wagons. 30 batteries were concealed at each of the following places: Zittau, Sachsen, Weisenberg, Bautzen, Konigswart, Brandenburg, Kottibus, Hoyerswerda, and Frankfort-on-Oder. "The Allied missions remain in ignorance of the stealthy work carried on throughout the country side."

On May 2nd, "in view of the fact that May 1st officially marks the end of German demobilization and the functioning of the new Army or Reichswehr," a report was issued by H.Q. American Army of Occupation. It stated:—

1. Since January volunteer units called Freiwilliger had been adopted by Government.

2. Volunteer detachments for the new Army had also been formed amongst corps of the old Army.

3. The Reichswehr had been officially established until May 1st, 1920, at an approximate strength of 250,000 men and 50,000 home guards, all voluntarily enlisted.

4. Included in the above was a corps of 50,000 with H.Q. at Berlin, directly under the War Minister.

5. The disposition of the troops was: On east front 140,000: Berlin 40,000: Westphalia 25,000: elsewhere 20,000. Total new army available, 225,000. Add 100,000 old army in garrisons, etc. Grand total, 350,000.

6. These figures are exclusive of home guards, etc., and over 4,000,000 ex-soldiers in the country.

7. Approximately 1,400,000 men could be mobilized.

At the end of May a French military critic diagnosed the situation as follows:—

1. During the war Germany called up 14,000,000 men. 6,000,000 of these were serving last August. The 1920 class, 500,000 strong, has been fully trained and suffered no casualties. For four years Germany will have an excellent army, superior to that of 1918.

2. The Peace Treaty professes to suppress universal service. This has never existed. The annual contingent of recruits was so large that only half of it was incorporated. Thus in 1911, out of 1,271,384 recruits medically examined, 460,964 were passed as fit, and only 207,741 actually enlisted.

3. Before the war there were 4,700,000 trained and 5,700,000 partially or untrained men available. During the war, thanks to a good system of cadres, recruits could be put into the firing line after 3 or 4 months' training.

4. Before the war 700,000 men were under arms, with about 32,000 officers, 90,000 trained N.C.O.s and 8,000 re-enlisted men. After the war the officers and men will have nominally disappeared, but the 100,000 long-service men allowed will replace the N.C.O.s of the old army. The cadre of officers still exists and can easily be re-formed. Moreover, there are available 500,000 of the 1920 class, and 5,000,000 to 6,000,000 veterans.

5. The Army has been defeated, but not destroyed. Rested and reorganized it can become very formidable.

6. "If Germany is pleased to disregard the limitations of armament she has accepted, it is difficult to see who will force her to observe them and what means will be available."

By mid-June 148,000 men were reported to be concentrated on the eastern frontier. They comprised 20,000 volunteers, 24,000 Grenschust under Colours, 89,000 reserve troops of the east, 8,000 mobilized employees, 6,000 colonists, 900 cavalry. 30 per cent. was good material, aged 20—35: 10 per cent. fair: 50 per cent. poor, aged 15—18. They were provided with gas equipment, hand grenades, 2,000 machine-guns. The reserves were composed mainly of officers and N.C.O.s of the old Army. Recruiting and manufacture of munitions were proceeding vigorously. At several stations, notably Tezen, Zajaczowe, Liebenkof, 24 batteries of 7·5 cm., 15 cm., and 18 cm. guns were concealed. General Lettow-Vorbeck, of East African fame, had been at Danzig since May 12th as Commander-in-Chief.

HUNGARY.

During April the Allied advance continued. The Rumanians were reported to be employing 6 divisions: 2 French and 2 Serb divisions were in the Banat. The strength of the Czechs was not given, but they were being assisted by Italian officers. The Hungarians had 5 infantry and 2 cavalry divisions, in a "disorganized" condition.

During May halts were imposed from Paris on the 5th and 16th. The Hungarians then opened an offensive against the Czechs. The Italian officers were being relieved at the time by French, and on the 31st a French General assumed command. Against the Czechs the Hungarians had 15,000 well-disciplined regulars, 8 batteries of 75 mm. guns, and a total estimated at 80,000 men. They were well supplied with material. Four divisions were reported on the Czech front, each with 2 to 4 aircraft, 2 on the Rumanian, 1 on the Slav, 1 in reserve, 32,000 men (workmen's battalions) with 48 guns at Buda Pesth, or a total of 110,000 men with 80 guns, giving a fighting strength of 66,000. About May 13th the Czech Government had budgeted for 243,000 regulars, 14,000 volunteers, and 28,000 horses. The exact numbers available were not known; but they were considerably less than those of the Hungarians, and lacked supplies.

On June 9th the Hungarian offensive was stopped from Paris. Hostilities ceased on 20th and on 29th the Hungarian withdrawal from Czecho-Slovakia began.

Operations.

April.—Hungarian concentration against Czechs at Waitzen (N. of Buda Pesth): against Rumanians, along Arad railway.

April 23rd.—Rumanians captured Grosswardein junction.

April 24th.—Rumanians captured Kir Jano, Male Szalka: reached Nagy Szalonia, Debreczin.

April 25th.—Rumanians reached Nagy Kalla, advanced on Csop. Serbs captured Szegszard.

April 29th.—Rumanians reached Szentes, Kun Szent Marton, Mezo Tor; 13th Shekler Division (5,000 men, 13 guns) surrendered. French and Serbs captured Hodmezo Vasarhely. Czechs attacked Csaba, Satoralja Ujhely, in Hernad, Bodya, Upper Sajo valleys.

May 1st.—Rumanians captured Szolnok (55 miles S.S.E. of Buda Pesth): crosed the Theiss there and at Tisza Polgar. Czechs reached Banreve. Hungarians evacuated Miskolcz.

May 2nd.—Czechs reached Erlau (Eger, 65 N.E. of Buda Pesth): advanced on Waitzen.

May 5th.—Allied halt.

May 16th.—Rumanians occupied Arad. Rumanians now on the Theiss, N. of Czegedin—Tokay: Czechs Tokay—Jablancka Pass. Allied halt.

May 25th.—Czechs pressed back at Misholcz.

June 1st—8th.—Czechs pressed back at Kaschau, Selmuz Koprona, Nagyasuranlf. Hungarians reached 50 miles N. of Kaschau.

June 9th.—Hungarian offensive ordered to stop from Paris.

ITALY.

Demobilization.—By June 17th, 225 general, 74,993 other officers, 210,000 men had been demobilized. The men included 178,000 of the 1874-89 classes, 1900 class, 850,000 unfit, 350,000 of the 1888-99 classes "for professional reasons," pivotal men, and "for particularly unfortunate family conditions." A large number of the 1888-99 classes were retained pending employment. The class system hindered release of men for agriculture. Many who had returned from abroad were reluctant to emigrate again.

RUMANIA.

During the war 850,000 men (600,000 combatants) were mobilized. 112,567 were killed or missing, 46,000 prisoners (about 50 per cent. of those taken) died in captivity.

RUSSIA.

April.—At the beginning of April there were in the field 12 Bolshevist armies, each of 3 to 11 divisions, totalling 500,000 men with 2,000 guns. Another 500,000 were estimated to be in reserve. Five armies, numbering 125,000 men, were on the east front: the 6th Army, 50,000 strong, on the north front: a small force in Turkestan: and the remainder on the Baltic, west, and south fronts. The Finns had 30,000 regulars and 70,000 volunteers available. At the end of the month the Bolshevists were mostly on the defensive. On the north front they had withdrawn on the Murmansk railway: on the west front, from near Poneviez and east of Vilna. On the south front they had reached the Dniester and opened an offensive on the Manitch. On the east front the Siberian army was advancing on Uralsk, astride the Samara—Tashkend railway, and towards the confluence of the Kama and Volga.

May.—During May British reinforcements arrived on the north front, and the Allied advance from north and west closely threatened Petrograd. The following dispositions were reported on the 23rd:—In Esthonia, etc., 6 Esthonian, 10 Letts divisions, and 34 Bolshevist regiments. On the Narva sector, 2 Esthonian divisions (7,000 infantry, 600 cavalry, 20 heavy, 30 field guns). Heinanen—Marienburg, 1 Letts division. Marienburg—Pskoff—Outava, 2 divisions. Bolshevists, 23,000 infantry, 12,000 cavalry, 80 heavy, 30 field guns. By the end of the month the Finns from Viborg were 20 miles, and the Esthonian main force 35 miles, from Petrograd: while the North Russian (Esthonian) corps was on the railway 15 miles west of Gatchina. The capture of the city was only delayed by (*a*) the difficulty of feeding the population except by sea, (*b*) the possession of Kronstadt by the Bolshevists closing the sea route. On the west front the Poles established contact with the Rumanians. On the south front, the volunteer army routed the 10th Bolshevist Army. On the east front, after advancing 250 miles on a 700-mile front, and drawing off 20,000 Bolshevists from the north front, the Siberian Army experienced a check and lost Samara. It had only employed Russian troops, the Czecho-Slovaks guarding the railway.

June.—On June 2nd negotiations were opened by the Peace Conference at Paris with a view to the recognition of the Government formed by Admiral Koltchak. These presumed the early arrival of that Government at Moscow, and the admission of Russia to the League of Nations "as soon as she is constituted on a democratic basis." On the 12th Admiral Koltchak's Government was recognized by the Allies.

On June 6th the War Secretary said:—(*a*) British troops would be withdrawn from the Caucasus, (*b*) £2,000,000 worth of munitions had been supplied to the Russian armies, (*c*) British casualties in Russia since the Armistice were 12 officers, 116 men killed, 14 officers, 152 wounded, 26 men missing.

On June 22nd the Diet of Finland proclaimed a Republic.

The Germans in Russia.—During March "a German force of considerable size" advanced on Wenden and Riga. Grodno, Vilna, and other places were subsequently evacuated. In April the Lettish Government was overthrown, and the "Baltic Barons" assumed sway, disarming part of the Lett troops. On May 18th German troops occupied Riga, and on 27th Uexkull. On May 30th a note was presented to the German Armistice Commission at Spa, requiring German troops to be withdrawn to a line to be marked, all Lettish arms to be restored, and Lettish mobilization to be permitted without restriction. The terms to be accepted by June 15th. On June 6th—8th German troops attacked the Esthonians; on June 15th they were withdrawn on orders from Weimar. On June 19th a further note was presented. It required (*a*) the prevention of any advance against the Esthonians, (*b*) the evacuation, "immediately" of Windau and Libau, "speedily" of all territories forming part of the Russian Empire before the war (Article 7, Armistice Convention). A conference was called at Walk, which the German delegates failed to attend. On the 22nd the German advance against the Esthonians was resumed. Martial law was proclaimed at Riga, and a German officer appointed Governor. On 25th—26th German troops attacked the Letts.

Operations in April.

North Front.—1st, attack repulsed on Bolsheozerki (Vologda railway). Russian Nationals engaged.

3rd, attack repulsed on Schredmechenga. Russians, Slavo-British Legion engaged.

11th, Bolshevists pressed back 10 miles S. of Uros.

17th, captured Vojmosalmi (S.E. bank Lake Vigo): 21st, Povienetz.

21st, cleared Ust Ishma (confluence of Ishma and Petchora rivers).

22nd, Finn volunteers captured Olonetz (near Lake Ladoga, 100 miles N.E. of Petrograd).

29th, Finns occupied Ladeinol Polie: cut railway.

West Front.—13th—18th, Bolshevist—Rumanian scraps in Mohileff sector (left bank Dniester).

17th, two Polish divisions railed from France to Warsaw.

18th, Bolshevist army on the Pripet surrendered to Ukrainians near Homel. 20,000 prisoners, 25 guns, etc.

21st, Poles captured Vilna, Baranovitchi junction.

26th, Bolshevists occupied left bank Dniester, Rybnitsa—Black Sea. Ukrainians recaptured Kieff, Poles Ochmiani (25 miles S.E. of Vilna).

South Front.—6th, Odessa evacuated. Bolshevists captured Perekop, entered Crimea.

10th, Kherson evacuated. Bolshevists captured Simferopol, Eupatoria.

14th, Bolshevists occupied Yalta.

17th, Bolshevists reached Sebastopol. British withdrew from trans-Caspia except Krasnovodsk.

19th, French recaptured Fort Mamelon Vert, Sebastopol. Seven days' armistice.

23rd, Kuban Cossacks recaptured Mariupol: 6,000 prisoners.

26th, Bolshevists occupied Theodosia.

Bolshevists advanced on the line of the Manitch: crossed the river near Tzaritzin—Ekaterinodar railway: captured line as far as Mechentinshaya (48 miles S.E. of Rostoff): captured Manichskaya (on the Don, 23 miles E. of Rostoff).

East Front.—Siberian Army continued advance on Viatka—S. of Sarapul.

12th, captured Belebeh, Menzelinst.

13th—20th, captured Sarapul, 25,000 prisoners, etc.; Izhevsk (20 miles N.W. of Sarapul): Glazoff (between Perm—Viatka). Repulsed counter-attack at Tisia Gory (on the Kama, 100 miles E. of Kazan).

23rd, Ural Cossacks captured Orsk, advanced on Orenburg.

OPERATIONS IN MAY.

North Front.—2nd, attack repulsed Vaga sector.

3rd, Russian troops captured Moselskaya (on Murmansk railway, 25 miles S. of Urosozero).

5th, Bolshevists recaptured Olonetz, two attacks repulsed Vaga sector. Flotilla arrived in rear of positions.

6th, attacks repulsed Grishinskaya, Bereznisk (Shenkursk sector). Successful raid on Tulgas (20 miles above Dvina—Vaga confluence).

7th, Russians captured Morskaya Maselga, occupied Danilorskoe.

9th, attack repulsed Morskaya Maselga.

18th, recaptured Povienetz (N. shore Lake Onega), Tulgas.

20th, captured Lumbishki and main position near.

24th, captured Medvyejva Gora (6 miles S., N.W. of Lake Onega).

25th, Finns occupied Paljarvt (N. of Petroyavodsk on Murman railway, within 17 miles of British advanced guards): near Oloniets, retired on the Tuloska.

26th, British reinforcements began to arrive.

North-West (Baltic) Front.—11th, Esthonians recaptured Narva (lost on 8th), and—

15th, Gdoff (20 miles S.). Landed at Kaskalovo (20 miles N.N.E.). Since April 24th 60,000 prisoners, 250 guns.

18th, Letts captured Pernau, occupied Duanamuende, reached the Aa (12 miles N. of Riga). Germans occupied Riga, reached the Jaegel.

20th, Esthonians reached 18 miles E. of Yamburg (on Narva—Petrograd railway): further N. captured Koperje (50 miles from Petrograd). British squadron at Luga Bay.

21st, captured Peterhof (13 miles W. of Petrograd).

22nd, captured Krasnoe Selo (16 miles S. of Petrograd), Volosava (48 miles E. of Narva), Raskopol (50 miles N. of Pskoff), Sbolsk.

24th, captured Kikerino (on Narva—Petrograd railway, 20 miles W. of Gatchina). Cleared coast.

25th, captured Wolmar (N.E. of Riga), Pskoff. Letts occupied Poneviez. Bolshevists retired on 200 mile front, Dvinsk—Libau railway—Baranovitchi.

27th, Germans captured Uexkull (on Dvina, 20 miles N.E. of Riga).

29th, Esthonians repulsed attack 30 miles W. of Petrograd. Letts captured Allsvig station, advanced on Marienburg.

West Front.—Poles attacked Ukrainians on Lemburg—Nikolaivsk railway. Crossed the Dniester.

27th, captured Stanislau. Advanced stopped from Paris.

29th, linked up with Rumanians.

South Front.—Volunteer army reinforced. Recaptured Manishkaya: regained S. bank of the Manitch: crossed river 17 miles S.E. of railway. On Donetz sector captured Jugansk, Slavyandserbsk (10 miles N.).

9th, captured Remontnoom (Bolshevist depot). 3,500 prisoners, 15,000 new rifles, 13 guns, etc.

10th, two Bolshevist regiments surrendered. 10th Bolshevist Army defeated on whole front. 10,000 prisoners, 28 guns, etc.

By 29th Volunteer army captured Bakhmut, crossed the Donetz, reached within 70 miles of Tsaritsin (on Volga). Now 15,000 prisoners, 60 guns. 10th Bolshevist Army estimated to be reduced to 10,000 men.

Caspian sector. 9th, Bolshevists captured Alexandrovsk (E. shore Caspian): 16th, driven out.

21st, Bolshevists occupied Merv.

26th, Bolshevists occupied Kusht (on railway S. to Afghan frontier).

East Front.—11th, Siberian Army: on Sarapul—Kazan railway, reached the Viatka, captured Viatskaya Poliany (100 miles E. of Kazan): on the Kama, reached 66 miles E. of Kazan.

23rd, crossed at Kama—Viatka confluence (90 miles E. of Kazan).

28th, left and left centre pressed back. Bolshevists captured Samara.

Operations in June.

North Front.—13th, Bolshevists pressed back 8 miles S. of Medvyejva Gora (N.W. Lake Onega).

19th, captured Kartashi (17 miles further S.).

22nd, Dvina. After repulsing attacks, occupied Chestako (5 miles S.E. of Troitsa).

24th, captured Fedotovo (12 miles S. of Povienetz, Lake Onega).

28th, captured Dianova Gora, reached head of Lake Onega.

North-West (Baltic) Front.—1st—4th, Esthonians repulsed attacks Luga sector. Advanced in Kreuzburg sector, on Wenden.

5th, Germans destroyed Wenden—Ramotskoe railway bridge.

6th, Germans attacked Esthonians. British occupied Oesel Island (off Riga) by arrangement.

8th, Esthonians reached 25 miles W. of Krasnoe Selo: pressed back at Ramotskoe by Germans.

9th, Esthonians reached Kreuzburg—Jacobstadt junction (50 miles from Dvinsk).

13th, North Russian troops captured Krasnaya Gorka Fort (opposite Kronstadt. Lost 16th, recaptured 17th).

15th, German troops withdrawn.

22nd, Germans advanced against Esthonians, Riga Gulf—Ronneburg.

23rd, Esthonians recaptured Wenden, Roopa, reached the Aa. Lithuanians pressed Bolshevists back, approached Dvinsk, reached Jacobstadt: established contact with Esthonians and Letts.

West Front.—By 7th Ukrainians captured Chepetovka, Staro Konstantinoff, Shmerinka, Berditcheff, Jitomir (towns between Kieff and Galicia). Cut Bolshevist line of retreat Kieff—Odessa. Defeated Bolshevists Dubno—Kremenetz, advanced beyond Iampol. The two Ukrainian armies joined.

15th, Ukrainians recaptured Tarnapol from Poles, crossed the Sereth.

25th, Reached 20 miles from Lemberg.

28th, Polish counter-offensive begun.

South Front.—1st, now 99,000 square miles territory gained. 32,000 prisoners, 348 guns, large stores, etc.

20th, Volunteer armies captured Simferopol.

24th, ,, ,, ,, Kharkoff, Konstantinograd.

27th, ,, ,, ,, Sebastopol, Perekop, Ekaterinoslav.

30th, ,, ,, ,, Tsaritsin: 70 guns, etc.

Towards Astrakhan, little resistance. 10th Bolshevist Army lost 75 per cent. of effectives. On mid-Don sector: 14th, 16th, 23rd Bolshevist Divisions dispersed, 9th Bolshevist Army cut in two, contact established with 22,500 Don Cossacks. In Donets Basin: 13th Bolshevist Army in retreat.

East Front.—6th, Bolshevists captured Glazoff.

8th, Bolshevists crossed the Bielaya, 35 miles S.E. of Ufa, occupied Alexandrovka station (17 miles N. of Ufa).

11th, Bolshevists crossed the Chepsta (near Glazoff), reached 17 miles N.W. of Birsk, occupied Volkinsky Zavid (near Sarapul).

15th, Bolshevists pressed back over the Bielaya, S. of Ufa.

17th, Bolshevists pressed back to Yanaul (on Krasno—Ufimsk railway), and from Debessy (90 miles S.W. of Perm).

18th, Bolshevists occupied Kez (51 miles E. of Glazoff), reached 10 miles nearer Perm.

19th, Bolshevists occupied Archangelsky (40 miles S.E. of Ufa), Kuzma station (midway Glazoff—Perm).

21st, Bolshevists reached 30 miles S.W. and 37 miles N.W. of Perm.

22nd, Bolshevists occupied Ossa, Okhansk: crossed the Kama.

23rd, Bolshevists reached 26 miles E. of Ufa.

26th, Bolshevists reached 22 miles W. of Perm.

Serbia.

During April men of 20—40 were mobilized. In May troops advanced on the Styrian—Carinthian frontier. On June 6th they occupied Klagenfurst, and the Austrian delegates signed an armistice.

On June 2nd the new Kingdom of the Serbs, Croats, and Slovenes was recognized.

Turkey.

In Asia minor, early June, Greek troops occupied the line Aivili—Bergamr—Manissa—Kassaba—Udemish—Aidin—Nazilli (30 miles E.)—Mediterranean Sea.

19th, Turks advanced. Nazilli evacuated.

22nd, Turks occupied Nazilli.

30th, ,, ,, Aidin.

They had good artillery and plenty of ammunition. The Greeks retired on Pergamos—Magnesia—Nymphaion.

CORRESPONDENCE.

The Indian Cavalry Brigade in Palestine.

The Editor has received the following note from a correspondent, in reference to the article under the above title which appeared in the Journal for May last:

"Page 233, footnote, 'London Territorials and Indians under General J. Shea.' The Division which took a leading part, anyhow as much as General Shea's, was the 7th Meerut Division, which fought through France and Mesopotamia, etc., etc., and was also commanded by an Indian cavalryman. It did thirty-six miles across the hills and took Samaria and Mersurieh exactly forty-eight hours from the hour it started.

"Page 245. The whole of paragraph commencing 'in fact' and ending 'three months after its capture.' The 7th Division arrived in Haifa by September 27th

and 28th on their hard flat feet! They arrived in Beirut beginning of October, the first troops thus having marched from Haifa to Beirut in five days; one column did forty miles in thirty-six hours, another thirty-six miles.

"The 7th then went to Tripoli and twenty miles beyond. The G.O.C. volunteered to get a brigade on from there to Aleppo if wanted, but it was not considered necessary; but the whole of the Division was fit and ready to go on to Aleppo, and could have been there shortly after the 5th Cavalry Division if they had been required to do so. One of the brigades was sent back to Beirut, and from there embarked and went to Cilicia with H.Q. at Adama. The brigade your correspondent mentions had been two months ten miles out of and N. of Tripoli, and was hutted and very comfortable, when it was ordered off to help the 5th Cavalry Division at Aleppo. I mention all this in justice to the 7th Division, which was in front the whole time and which marched 250 miles as a complete division over hills and with only pack transport and the kit the men carried on their backs between September 19th and middle of October."

PRINCIPAL ADDITIONS TO LIBRARY.

May—June—July, 1919.

BRIEF HISTORY AND DESCRIPTION OF THE CITY OF JERUSALEM TOWN PLANNING SCHEME. Prepared by W. H. McLean, Esq., M.I.C.E., Engineer-in-Chief, Alexandria Municipality, August 20th, 1918. Photographs and Plans. Fol. (Presented by General Sir E. H. H. Allenby, G.C.B., G.C.M.G.).

WAR AT SEA. MODERN THEORY AND ANCIENT PRACTICE. By Admiral Sir Reginald Custance, G.C.B., etc. Plans and Charts. 8vo. 12s. 6d. (Blackwood & Sons). Edinburgh, 1919.

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